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ANTHROPOLOGICAL PAPERS

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THE ARCHAEOLOGY OF THE YAKIMA VALLEY.

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INTRODUCTION.

The following pages contain the results of archaeological investigations carried on by the writer for the American Museum of Natural History from May to August, 1903,¹ in the Yakima Valley between Clealum of the forested eastern slope of the Cascade Mountains and Kennewick, between the mouths of the Yakima and Snake Rivers in the treeless arid region, and in the Columbia Valley in the vicinity of Priest Rapids. My preliminary notes on the archaeology of this region were published in *Science*.² Definite age cannot be assigned to the archaeological finds, since here, as to the north, the remains are found at no great depth or in soil the surface of which is frequently shifted. Some of the graves are known to be of modern Indians, but many of them antedate the advent of the white race in this region or at least contain no objects of European manufacture, such as glass beads or iron knives. On the other hand, there was found no positive evidence of the great antiquity of any of the skeletons, artifacts or structures found in the area. The greater part of the area was formerly inhabited by Sahaptian speaking people, including the Yakima, Atanum, Topinish, Chamnapum, and Wanapum, while the northern part of it was occupied by the Piskwans or Winatshmpui of the Salish linguistic stock.³

Near North Yakima we examined graves in the rock-slides along the Yakima and Naches Rivers; a site, where material, possibly boulders, suitable for chipped implements had been dug and broken with pebble hammers, on the north side of the Naches about one mile above its mouth; pictographs on the basaltic columns on the south side of the Naches River to the west of the mouth of Cowiche Creek; petroglyphs pecked into basaltic columns in Selah Canon; ancient house sites on the north side of the Naches River near its mouth, and on the north side of the Yakima River below the mouth of the Naches; remains of human cremations, each surrounded by a circle of rocks on the point to the northwest of the junction of the Naches

¹ A brief report of the operations of this expedition appeared in the *American Museum Journal*, Vol. IV, No. 1, pp. 12-14, January, 1904. It was slightly revised and appeared in *Science N. S.* Vol. XIX, No. 484, pp. 579-580, April 8, 1904, and *Records of the Past*, Vol. IV, Part 4, pp. 119-127, April 1905.

² *N. S.* Vol. XXIII, No. 588, p. 551-555, April 6, 1906. Reprinted in the *Seattle Post Intelligencer* for March, 1906, the *Scientific American Supplement*, Vol. LXII, No. 1602, September 15, 1906, and in the *Washington Magazine*, Vol. I, No. 4, June 1906. Abstracted in the *Bulletin of the American Geographical Society*, May, 1906.

³ Mooney, Plate LXXXVIII.

and Yakima Rivers; recent rock-slide graves on the eastern side of the Yakima River above Union Gap below Old Yakima (Old Town); the surface along the eastern side of the Yakima River, as far as the vicinity of Sunnyside; graves in the domes of volcanic ash in the Ahtanum Valley near Tampico; and rock-slide graves in the Cowiche Valley.

We then moved our base about thirty miles up the Yakima River to Ellensburg, Mr. Albert A. Argyle examining the surface along the western side, en route. From Ellensburg, rock-slide graves and human remains, surrounded by circles of rocks, as well as a village site upon the lowland, were examined near the mouth of Cherry Creek. A day spent at Clealum failed to develop anything of archaeological interest in that vicinity, except that a human skeleton had been removed in the sinking of a shaft for a coal mine.

From Ellensburg we went to Fort Simcoe by way of North Yakima and near the Indian Agency observed circles of rocks, like those around the cremated human remains near North Yakima, and a circular hole surrounded by a ridge, the remains of an underground house. Crossing the divide from Ellensburg and going down to Priest Rapids in the Columbia Valley, no archaeological remains were observed except chips of stone suitable for chipped implements which were found on the eastern slope of the divide near the top and apparently marked the place where material for such implements, probably float quartz, had been quarried. On the western side of the Columbia, on the flat between Sentinal Bluffs and the river at the head of Priest Rapids, considerable material was found. This was on the surface of the beach opposite the bluffs and on a village site near the head of Priest Rapids. Graves in the rock-slides, back from the river about opposite this site, were also examined. Some modern graves were noticed in a low ridge near the river, a short distance above the village site. Crossing the Columbia, some material was found on the surface of the beach and further up, petroglyphs pecked in the basaltic rocks at the base of Sentinal Bluffs were photographed.

The writer wishes to acknowledge his indebtedness to Mr. D. W. Owen of Kennewick for information, for permission to examine his collection, to make notes and sketches of specimens in it, and for presenting certain specimens;¹ to Mr. Frank N. McCandless of Tacoma for permission to study and photograph the specimens² in his collection containing part of the York collection in the Ferry Museum, City Hall, Tacoma; to Mr. Louis O. Janeck of 415 North 2nd. St., North Yakima for information and for per-

¹ See Figs. 10, 39, 42, 56, 57, 107 and 124.

² See Figs. 35, 45, 79, 100 and 113.

mission to study and photograph the specimens ¹ in his collection as well as for supplementary information since received from him; to Hon. Austin Mires of Ellensburg for information and permission to study and photograph specimens ² in his collection; to Mrs. O. Hinman of Ellensburg for permission to photograph specimens ³ in her collection; to Mrs. J. B. Davidson of Ellensburg for information and permission to study her collection and to make drawings of specimens ⁴ in it, and for the pipe shown in Fig. 106; to Mr. W. H. Spalding of Ellensburg for permission to photograph specimens ⁵ in his collection; to Mrs. Jay Lynch of Fort Simcoe, for information and permission to photograph specimens ⁶ in her collection; to Mr. W. Z. York of Old Yakima for permission to sketch and study specimens ⁷ in his collection, and to others credited specifically in the following pages. The accompanying drawings are by Mr. R. Weber and the photographs are by the author, unless otherwise credited.

GEOGRAPHICAL DESCRIPTION.

Clealum is situated on the Yakima River, at a point on the Northern Pacific Railway, 122 miles east of the humid, heavily forested coast at Puget Sound. Although situated not over 154 miles from Copalis, on the ocean at the western edge or furthest limit of the temperate humid coast country, the summers are hot and dry and the winters severe. It is 1909 feet above the sea level and far enough towards the summit of the Cascade Mountains, that marks the line between the humid coast and the arid almost treeless interior, to find considerable moisture and many trees.

Ellensburg is situated near the eastern side of the Yakima River, 25 miles below Clealum, at an altitude of 1512 feet above the sea level and in the wide somewhat flat Kittitas Valley which was, in former geologic times, a lake bottom. The river flows rapidly and its low banks at places are high enough to form gravel bluffs. The surrounding country is arid and there is no natural forest growth.

Cherry Creek, one of a number of small streams on this side of the river, flows through the eastern part of this valley, and empties into the Yakima

¹ See Figs. 19, 20, 27, 28, 31, 33, 34, 46, 58, 60, 61, 63, 64, 65, 66, 67, 69, 81, 108, 109, 120 and 125.

² See Figs. 4, 5, 14, 15, 16, 24, 25, 32 and 44.

³ See Figs. 30, 36 and 116.

⁴ See Figs. 8, 47 and 106; see also p. 25.

⁵ See Figs. 11 and 59.

⁶ See Figs. 73, 119, 127 and 128.

⁷ See Figs. 26, 29, 104, 110, 111 and 112.

River about one mile below Thrall on Section 31, Town 17, North of Range 19 East. Here, the river enters Yakima Canon which cuts through Ump-tanum Ridge and the western foothills of Saddle Mountains. There are some pines in this canon.

Selah Creek flows through Selah Canon from the east and empties into the Yakima, about one mile above Selah at the northwest corner of Section 16, Town 14, north of Range 19 East. This is in a broad valley below Yakima Canon. At the time of our visit, however, the lower portion of this creek was dry. Wenas Creek empties into the Yakima from the west, nearly opposite Selah.

North Yakima is on the western side of the Yakima River, about two miles below the mouth of the Naches, which empties into the Yakima from the west, immediately below where the latter breaks through Yakima Ridge. This break is called the Gap or the Upper Gap. North Yakima is at an altitude of 1067 feet above the sea level. The soil of the valley is made up of a rich volcanic ash and the region is arid and practically treeless except on the banks of the rivers and creeks or where irrigation has been successfully practised. The climate in most respects resembles that of the southern interior of British Columbia, lying to the north, but in general, there is less vegetation except on irrigated land.

Cowiche Creek flows from the southwest and empties into the south side of the Naches, at a point about three miles above its mouth.

Tampico is situated on Section 17, Town 12, north of Range 16 East, on the north side of Ahtanum Creek, which flows nearly east along the base of the north side of Rattlesnake Range and empties into the Yakima at Union Gap or Lower Gap, below Old Yakima.

Fort Simcoe is located in a cluster of live oak trees, on one of the branches of Simcoe Creek, which flows in an easterly direction and empties into the Toppenish River, a western feeder of the Yakima. This place is at an altitude of 937 feet above the sea level and is surrounded by 'scab' land. Going west from Fort Simcoe, up the slopes of the Cascade Mountains, a mile or so, one notices timber in the valleys, and as one proceeds still further up the mountains, the timber becomes thicker and of greater size. This is the beginning of the forest, which at the west side of the Cascades becomes so remarkably dense. To the east of Fort Simcoe, however, no trees are seen, except in the bottoms along the streams, while on the lower reaches of the Yakima and on the banks of the Columbia, east of here, there are absolutely no trees.

Kennewick is located on the western side of the Columbia River about six miles below the mouth of the Yakima. It is opposite Pasco, which is about three miles above the mouth of Snake River. The place is only 366

feet above the sea level and except where irrigation has been practised, there are no trees in sight, the vegetation being that typical of the desert among which are sagebrush, grease-wood and cactus. Lewis and Clark, when here on their way to the Pacific Coast, October 17, 1805,¹ saw the Indians drying salmon on scaffolds for food and fuel. Captain Clark said, "I do not think [it] at all improbable that those people make use of Dried fish as fuel. The number of dead Salmon on the Shores & floating in the river is incredible to say * * * how far they have to raft their timber they make their scaffolds of I could not learn; but there is no timber of any sort except Small willow bushes in sight in any direction."

Sentinal Bluffs is the name given to both sides of the gap where the Columbia River breaks through Saddle Mountains. It is a short distance above the head of Priest Rapids. Crab Creek empties into the Columbia from the east on the north side of these mountains. On the western side of the river, between the Bluffs and the head of Priest Rapids, there is a flat place of considerable area, portions of which the Columbia floods during the winter. Going northwest from here to Ellensburg, the trail leads up a small valley in which are several springs surrounded by some small trees. One ascends about 2000 feet to the top of the divide and then descends perhaps 1000 feet into the Kittitas Valley.

ARCHAEOLOGICAL SITES.

At Clealum, we found no archaeological remains, except a single human skeleton unearthed in the sinking of a shaft for a coal mine. Here, however, our examination of the vicinity was limited to one day, and it is possible that a more thorough search might bring to light archaeological sites. Specimens from the vicinity of Clealum are unknown to the writer, although there are a number of collections from the vicinity of Ellensburg, Priest Rapids, Kennewick and other places lower down. The abundance of specimens on the surface near Priest Rapids and Kennewick in proportion to those found near North Yakima and Ellensburg, suggests that the high parts of the valley were less densely inhabited and that the mountains were perhaps only occasionally visited. It would seem possible that the prehistoric people of the Yakima Valley had their permanent homes on the Columbia, and possibly in the lower parts of the Yakima region. This is indicated by the remains of underground houses, some of which are as far up as Ellensburg. These remains are similar to those found in the Thompson River region, where such

¹ Lewis and Clark, III, p. 124.

houses were inhabited in the winter. The people of the Yakima area probably seldom went up to the higher valleys and the mountains, except on hunting expeditions or to gather berries, roots and wood for their scaffolds, canoes and other manufactures. If this be correct, it would account for the scarcity of specimens upon the surface along the higher streams, since all the hunting parties, berry, root and wood-gathering expeditions were not likely to leave behind them so much material as would be lost or discarded in the vicinity of the permanent villages. Spinden states¹ that in the Nez Perce region to the east of the Yakima country, permanent villages were not built in the uplands, although in a few places where camas and kouse were abundant, temporary summer camps were constructed.

In the vicinity of Ellensburg, we found no archaeological specimens except the chipped point mentioned on page 163, but this may be due in part to the modern cultivation of the soil and to the fact that the irrigated crops, such as are grown here, hide so much of the surface of the ground. A search along portions of the level country west of the town and even in such places as those where the river cuts the bank, failed to reveal signs of house or village sites. In Ellensburg, I saw a summer lodge, made up of a conical framework of poles covered with cloth and inhabited by an old blind Indian and his wife. East of the city, near the little stream below the City Reservoir was another summer lodge made similarly, but among the covering cloths was some matting of native manufacture. The remains of an underground house, possibly 30 feet in diameter were seen to the east of the Northern Pacific Railway, between Ellensburg and Thrall.

On the little bottom land along the western side of Cherry Creek, near its mouth, at the upper end of Yakima Canon, we found objects which show that the place had been a camping ground. This is immediately south of where an east and west road crosses the creek on the farm of Mr. Bull. On this village site were found the specimens catalogued under numbers 202-8213 to 8222, of which two are shown in Plate II, Fig. 12, and Fig. 52. The opposite side of this stream strikes one of the foothills of the uplands, the western extension of Saddle Mountains. On the top of this foothill, which overlooks the above mentioned village site, were a number of burials marked by circles of rocks.² In the rock-slide on the side of this hill, between these circles and the village site below, were a number of graves which are described in detail under numbers 99-4326-4332 and 202-8223-8258 on pages 164 to 166. Some of the objects found, many of which are recent and show contact with the white race, are shown in Figs. 71a, 72, 74, 78, 80, 82-86, 90-92, 95, and 96.

¹ Spinden, p. 178.

² See 99-4325, page 163.

On the western side of the Yakima, about opposite the above-mentioned village site, a rock-slide appears at the head of Yakima Canon. In it are a number of rock-slide graves marked by sticks.

In Selah Canon, on the north side of Selah Creek, about a mile and a half above where it empties into the Yakima are three groups of petroglyphs pecked into the vertical surface of the low basaltic cliffs of the canon wall. Two of these groups (Plate XII) are upon eastern faces of the rock, while the one shown in Fig. 1, Plate XIII, is upon a southern exposure. In the rock-slide on the south side of Selah Canon, about three quarters of a mile above the Yakima or about half way between these petroglyphs and the Yakima, were found a number of graves, one of them marked by a much weathered twig. These were the only archaeological remains seen by us in Selah Canon, although we examined it for at least two miles from its mouth.

On the north slope of Yakima Ridge, near its base, at a point where the Moxee Canal and the river road turn and run west along the base of the ridge or about southeast of the largest ranch there, possibly two miles northeasterly from the Gap, were a number of scattered graves covered with rock-slide material. About one quarter of a mile west from here, a little west of south of the ranch, was a large rock-slide, covering a short northerly spur of the ridge. This is shown from the southwest in Plate VII. It is about three quarters of a mile northeast from where the Yakima River, after flowing through bottom lands, strikes the base of the Yakima Ridge. In this slide were a large number of shallow parallel nearly horizontal ditches below each of which is a low ridge or terrace of the angular slide-rock. Among these terraces, as shown in Fig. 2 of the plate, were a few pits surrounded by a low ridge, made up of jagged slide-rock, apparently from out of the pits. It was naturally larger at the side of the pit towards the bottom of the slide. In none of these did we find human remains or specimens. Some of them are larger than similar pits that we found to be rock-slide graves. Their close resemblance to graves found to have been disturbed, part of their remains being scattered near by and to other graves, as they appeared after our excavations, suggests that these pits are the remains of such rock-slide graves from which the bodies have been removed by the Indians possibly since the land became the property of the United States Government. On the other hand, these pits remind us of rifle pits, though it does not seem probable that they would be built in such a place for that purpose and there is no local account of the site having been used for such pits. This rock-slide is particularly interesting because of the terraces into which most of its surface had been formed. The character of the rock-slide material is such that one may walk over these for some little time without noticing them, but once having been noticed, they always force themselves upon the attention. Standing near the top

of the slide, they remind one of rows of seats in a theatre. Each terrace begins at the edge of the slide and runs horizontally out around its convex surface to the opposite side. Some of them are wider than others. They resemble the more or less horizontal and parallel terraces formed by horses and cattle while feeding on steep slopes. The Yakima Ridge has been so terraced by stock in many places and over large areas. However, there is no vegetation on the rock-slide to entice stock and the difficulty of walking over the cruelly sharp rocks as well as the presence of rattlesnakes would seem sufficient to cause both cattle and horses to pass either below or above it. The outer edge of each terrace is probably little lower than the inner edge, but viewed from the slope it seems so, and this suggests that these terraces may have been entrenchments, though it would seem that they would be useless for such a purpose since one can easily reach the land above from either side. Moreover, it would not seem necessary to make parallel entrenchments down the entire slope. That they were made to facilitate the carrying of the dead to the rock-slide graves is possible but not probable. It seems unlikely that they could have been made for the seating of spectators to overlook games or ceremonies; for the sharpness of the rocks would make them very uncomfortable.

There is a much higher rock-slide on the east side of a small steep ravine near where the Yakima River flows close to the base of the ridge, about a mile northeast of the Naches River or Upper Gap. Near the top of this slide, possibly three hundred feet above the river, were similar pits larger than those just described. Two or three of these were bounded along the edge towards the top of the slide by an unusually wide terrace. Near the bottom of this slide were graves ¹ (Nos. 1 and 2) which are described in detail on page 153. Grave No. 1 was in the base of the rock-slide as shown in the figure and was indicated by a cedar stick projecting from a slight depression in the top of the heap of rock-slide material covering it. It was on a slight terrace about eighty feet above the river, and commanded a view over the valley of the Yakima to the north. The presence of the brass tube shown in Fig. 75 suggests that this grave is not of great antiquity. Grave No. 2 was in the same rock-slide about fifty feet down the ravine or to the north, and about forty feet above the Moxee flume. It was indicated by a hole in a pile of rock, like an old well. It was found to contain nothing, the remains having been removed. On the south side of the Yakima Ridge, near the bridge over the Yakima, at the Upper Gap, rock-slide graves are said to have been disturbed during the construction of the flume which carries the waters of the Moxee ditch around the western end of the Yakima Ridge, and

¹ See Fig. 3, Plate VI from the north of west.

during the gathering of stone on this point for commercial purposes. Some of these graves are said to have been above the flume.

Here and there, near the base of the ridge from this point easterly for about a mile, were found small pits, such as one shown in Fig. 1, Plate VIII. Apparently, these were rock-slide graves from which the human remains had been removed, either by the Indians in early times or more recently by visitors from the neighboring town of North Yakima. Possibly some of them are old cache holes. One of these graves near the top of a small rock-slide above the flume contained a human skeleton and is shown in Fig. 2, Plate VIII. Below these graves, on the narrow flat between the base of the ridge and the Yakima River at a point about three quarters of a mile below the Upper Gap at the mouth of the Naches River, were discovered a number of small pits each surrounded by a low ridge of earth which were probably the remains of cache holes made by the Indians during the last twenty years. On this flat, close to the river were two pits surrounded by a circular ridge which indicated ancient semi-subterranean house sites, further described on page 51.

It is said, that above the flume at a point about a mile and a half below the Upper Gap, rock-slide graves, some of which were marked by pieces of canoes were excavated by school boys. The writer was also informed by small boys that near the top of the ridge immediately above here, they frequently found chipped points for arrows but on examination discovered only chips of stone suitable for such points, the boys either having mistaken the chips for points or having collected so many of the points that they were scarce.

On the west side of the Yakima, at the Upper Gap, there is a raised flat top or terrace that overlooks the mouth of the Naches River to the southeast. Here were a number of circles made up of angular rocks. Within each we found the remains of human cremations. Unburned fragments of the bones of several individuals with shell ornaments were often present in a single circle.¹

Continuing westward, along the slope of the ridge, cut along its southern base by the Naches River, at a point about one and a quarter miles west of the mouth of the river, a small ravine cuts down from the top of the ridge. This has formed a little flat through the middle of which it has again cut down towards the river. East of this ravine on the flat is a circle of angular rocks such as are found scattered over the ridge. This circle no doubt marks a house site, the interior having been cleared of stone and the circle of rocks probably having been used to hold down the lodge covering.² To

¹ See p. 142 and Fig. 1, Plate IX.

² See p. 15 and Fig. 1, Plate IV.

the west of the ravine, where the flat is somewhat higher than to the east, there are the remains of two semi-subterranean houses. Each of these is represented by a pit surrounded by a ridge of earth, and on the top, are large angular rocks.¹ At a point where the ridge meets this flat, close to the western side of the ravine was a slight depression in a small rock-slide which marked what seemed to be a grave, but which, on excavation, revealed nothing. Still further westward at a point probably two miles above the mouth of the Naches River and overlooking the stream at an altitude of perhaps 250 feet, we found scattered over the ground along the eastern summit of a deep ravine, the first one west of the house sites above mentioned, numerous small chips of material suitable for chipped implements. These became more numerous as we proceeded northward up the eastern side of the ravine for a distance of about a quarter of a mile. Here we came upon the small quarry in the volcanic soil, shown in Fig. 1, Plate III. Immediately to the west of the pit was a pile of earth, apparently excavated from it.

On the top of this heap of soil and among the broken rock to the south and east of it, were found several water-worn pebbles, used as hammers in breaking up the rock, as indicated by the battered condition of their ends (p. 58). We saw no other water-worn pebbles on the surface of the ridge, but they were numerous in the gravel of the bottom-lands subject to the overflow of the rivers. It would seem that these pebbles were brought up from the river below for use as hammers. Scattered to the south of the pit were found large fragments of float quartz material containing small pieces of stone suitable for chipped implements but made up mainly of stone which was badly disintegrated. Lying on the slope of the ravine were many small fragments of this same stone which were clear of flaws.

It would seem that a mass of float quartz much of which was suitable for chipped implements had been found here. It had been excavated, leaving the pile of earth and then broken up with the river pebbles which were left behind with the waste. Probably there were fairly large pieces of the material, suitable for chipped implements, that were carried away while small pieces were left lying about a pile of unsuitable material. In other words, it would seem that these specimens mark a place for the roughing out of material for chipped implements.² On the same side of the river, on the side of a rather low ridge or table-land overlooking it, at a point about twelve miles above its mouth, are some rock-slides. Here it is said that graves have been found. They were probably typical rock-slide graves. On a point of land perhaps fifty feet above these and a few hundred feet to

¹ See p. 52 and Fig. 2, Plate IV.

² See p. 20.

the north, Master James McWhirter pointed out a grave on his farm. It was then surrounded by a ring made up of water-worn pebbles, apparently brought up from the river. He stated that an attempt had been made to excavate it which possibly accounts for the pebbles being in a circle rather than a heap over the grave. This grave was found to contain a slab of wood, shell ornaments, probably modern, and an adult skeleton, No. 12 (7), 99-4320, p. 156.

There are a number of painted pictographs on the vertical faces of the basaltic columns, facing north on the south side of the Naches River, immediately to the west of the mouth of Cowiche Creek. These are below the flume and may be reached from the top of the talus slope which has been added to by the blasting away of the rock above, during the construction of the flume. In fact, debris from this blasting has covered part of the pictographs. Some of the pictures are in red, others in white and there are combinations of the two colors.¹ Local merchants have defaced these pictographs with advertisements.

In the Cowiche Valley, there are several rock-slide graves, but these seem to have been rifled. Northeast of the fair grounds at North Yakima, the remains of an underground house are said to exist. A short distance east of Tampico, about 18 miles above the mouth of the Ahtanum, on the north side of the river and east of the road from the north where it meets the river road and immediately across it from the house of Mr. Sherman Eglin, was a grave located in a volcanic dome left by the wind, which Mr. Eglin pointed out to us. The site is about 600 feet north of the north branch of the Ahtanum and about fifteen feet above the level of the river. A pile of rocks about eight feet in diameter covered this grave, No. 25, p. 160. On the land of Mr. A. D. Eglin, between the above-mentioned grave and Tampico on the north side of the road were seen the signs of two graves, destroyed by plowing. Near here, an oblong mound six or eight inches high and ten feet wide by eight feet long, supposedly covering a grave, marked by a stone on the level at each side and each end, 12 and 16 feet apart respectively was reported by Mr. Eglin's son. A little distance further north and up the slope of the land, were a number of volcanic ash heaps left by the wind. The surrounding land is what is locally known as "scab land." In some of these knolls, graves have been found and one which has been explored is shown in Fig. 2, Plate ix. It is located near the pasture gate, and was marked by a circle of stones as shown in the figure. On excavating, nothing was found. It is possible that the remains were entirely disintegrated. Graves in rock-slides on hill sides, and a village site near this place were

¹ Further described under the subject of art on p. 119 and shown in Plates xiv-xvi.

reported by Mr. Eglin's son. Along the north side of Ahtanum Creek between Ahtanum and Tampico, below the rim rock of the uplands parallel to the creek are a number of rock-slide graves.

On the western side of Union Gap, through which the Yakima River flows, below the mouth of Ahtanum Creek, a short distance below Old Yakima, on a little flat or terrace projecting from the south side of Rattle Snake Range is a modern Indian cemetery surrounded by a fence. To the east of Union Gap, on the northwestern slope of Rattle Snake Range, we examined some rock-slide graves which had been made since the advent of objects of white manufacture. A mile or so south of Union Gap not far from the uplands to the east of the river was a ridge of earth extending north and south nearly parallel with the river road. This, however, I believe may be the remains of some early irrigation project. On the west side of the Yakima River about two miles south of Union Gap was seen a summer lodge made by covering a conical framework with mats.

At Fort Simcoe, immediately south of the Indian agency, on the north edge of the "scab land," overlooking a small ravine, is a large pit surrounded by an embankment of earth, the remains of a semi-subterranean house. Perhaps an eighth of a mile south of this, on higher "scab land" was a rather low long mound upon which were several piles of stone that probably marked graves. This mound was lower and more oblong than the usual dome in which such graves were made. Mrs. Lynch, who pointed these out has excavated similar piles at this place and found them to mark graves. We were informed that chipped implements were frequently found along the Yakima River at a point near Prosser. Above Kennewick, while digging a flume, a number of graves were discovered, from which Mr. Sonderman made his collection. Some of these graves contained modern material (p. 111).

On the surface of the western beach of the Columbia at Kennewick and on the flat land back of it we found chips of material suitable for making chipped implements, and a large pebble, probably a net sinker.¹ These, together with the fact that Mr. D. W. Owen has also frequently found specimens here, suggest that this place was an ancient camping ground. That Lewis and Clark saw Indians here and in the vicinity, as well as that the Indians still camp here on the beach of the river, sheltered from the wind by the bank and depending upon the river driftwood for their fuel, strengthens this suggestion. Specimens have been found on the large island in the Columbia at the mouth of the Yakima. (See p. 64.) At a point four miles below Kennewick or perhaps a mile below a point opposite the mouth

¹ See p. 30.

of the Snake, a grave which contained material of white manufacture is said to have been discovered by a man while hauling water up the bank of the Columbia.

Schoolcraft states¹ that there was an earthwork on the left bank of the Lower Yakima on the edge of a terrace about fifteen feet high a short distance from the water. This terrace was banked on either side by a gulley. This consisted of two concentric circles of earth about eighty yards in diameter by three feet high, with a ditch between. Within were about twenty "cellars", situated without apparent design, except economy of room. They were some thirty feet across, and three feet deep. A guide stated that it was unique and made very long ago by an unknown people. Outside, but near by, were other "cellars" in no way differing from the remains of villages of the region. What may be an earthwork near by is described by Schoolcraft² as follows: "The Indians also pointed out, near by, a low hill or spur, which in form might be supposed to resemble an inverted canoe, and which he had said was a ship." Schoolcraft suggests a possible relation of this to the mounds of the Sacramento Valley and continues:—

"In this connection may also be mentioned a couple of modern fortifications, erected by the Yakamas upon the Sunkive fork. They are situated between two small branches, upon the summits of a narrow ridge some two hundred yards long, and thirty feet in height, and are about twenty-five yards apart. The first is a square with rounded corners, formed by an earthen embankment capped with stones; the interstices between which served for loop-holes, and without any ditch. It is about thirty feet on the sides, and the wall three feet high. The other is built of adobes, in the form of a rectangle, twenty by thirty-four feet, the walls three feet high, and twelve to eighteen inches thick, with loop-holes six feet apart. Both are commanded within rifle-shot by neighboring hills. They were erected in 1847 by Skloo, as a defence against the Cayuse. We did not hear whether they were successfully maintained, accounts varying greatly in this respect. In the same neighborhood Captain M'Clellan's party noticed small piles of stones raised by the Indians on the edges of the basaltic walls which enclose these valleys, but were informed that they had no purpose; they were put up through idleness. Similar piles are, however, sometimes erected to mark the fork of a trail. At points on these walls there were also many graves, generally made in regular form, covered with loose stones to protect them from the cayotes, and marked by poles decorated with tin cups, powder-horns, and articles of dress. During the summer the Indians for the most part live in the small valleys lying well into the foot of the mountains. These are, however, uninhabitable during the winter, and they move further down, or to more sheltered situations. The mission which, in summer, is maintained in the A-tá-nam valley, is transferred into that of the main river." ³

¹ Schoolcraft, VI, p. 612.

² Schoolcraft, VI, p. 613.

³ Cf. also Bancroft, IV, p. 736; Stevens, pp. 232-3; Gibbs, (a), pp. 408-9.

After passing the top of the divide, to the left of the trail from Ellensburg to Priest Rapids, chips and fragments of variegated float quartz suitable for chipped implements were found. This apparently marked a place where a fragment of float rock had been broken up, but fine fragments were hardly numerous enough to indicate that the place had been a shop site, or at least a large one. The quantity of material broken up, judging from the amount of refuse, was small. On the western side of the Columbia, at the base of the basaltic rocks where they meet the bottom-land, perhaps a mile from the river were rock-slide graves in the talus slope. At the head of Priest Rapids, the river turns towards the west and then southward, flowing close to the southern end of this escarpment. On the flat, at the very head of Priest Rapids, the river, during high water had washed out the remains of a village or camp site, where pestles and animal bones were numerous. A short distance above this, in a low ridge near the river were some modern graves some of which were marked with sticks at the head and foot. The bodies, judging from the mounds of earth, were laid full length and many, if not all of them, judging from the size of the head and foot sticks, were placed with the feet towards the east. Perhaps a mile above here near the home of Mr. Britain Everette Craig, several large and deep pits, the sites of ancient semi-subterranean houses were seen. Above and near his house, the river had washed out what was apparently a village site, and perhaps a few graves. Here was found the small fresh water shell heap, shown in Fig. 1, Plate v, and the pile of flat oval pebbles which probably marked a cooking place, shown in Fig. 2. On the west beach of the Columbia at Sentinal Bluffs perhaps another mile further up the river, notched sinkers and other indications of a camp or fishing ground were found.

On the eastern side of the river near the head of Priest Rapids some material was found on the surface of the beach where the floods of the river had uncovered it. A mile or more above here, pecked on the basaltic columns of Sentinal Bluffs, which may be seen in both figures of Plate v were a number of petroglyphs, shown in Plate xi and described on page 121. Those shown in Fig. 1, photographed from the west, are on the columns to the east of the road, blasted through the rocks at this point, and perhaps fifteen feet from the river. Those in Fig. 2, photographed from the north, are to the west of the road on the columns which rise abruptly from the river. Some specimens and indications of habitation were found scattered between this point and the mouth of Crab Creek, the bed of which was dry in most places when we visited it.

RESOURCES.

The resources of the prehistoric people of the Yakima Valley, as indicated by the specimens found in the graves and about the village sites, were chiefly of stone, copper, shell, bone, antler, horn, feathers, skin, tule stalks, birch bark and wood. They employed extensively various kinds of stone for making a variety of objects. Obsidian,¹ glassy basalt or trap, petrified wood, agate, chalcedonic quartz with opaline intrusions, chert and jasper were used for chipping into various kinds of points, such as those used for arrows, spears, knives, drills and scrapers. According to Spinden,² obsidian was used in the Nez Perce region to the east where it was obtained from the John Day River and in the mountains to the east, possibly in the vicinity of the Yellowstone National Park. The people of the Yakima Valley may have secured it from the Nez Perce. As on the coast, objects made of glassy basalt were rare here, although it will be remembered that they were the most common among chipped objects in the Thompson River region.³ Mr. James Teit believes that glassy basalt is scarce in the Yakima region and that this is the reason why the prehistoric people there did not use it extensively. Some agate, chalcedony and similar materials were used in the Thompson River region, but while there is a great quantity of the raw material of these substances there, the Indians say that the black basalt was easier to work and quite as effective when finished. Several small quarries of float quartz had been excavated and broken up to be flaked at adjacent work shops, p. 16. River pebbles were made into net sinkers, pestles, mortars, hammerstones, scrapers, clubs, slave killers, sculptures, and similar objects, and were also used for covering some of the graves in the knolls. Serpentine was used for celts and clubs; lava for sculptures. Slate was used for ornamental or ceremonial tablets steatite for ornaments and pipes, though rarely for pestles and other objects; and impure limestone for pipes. Fragments of basaltic rock were used for covering graves in the rock-slides and in some of the knolls. Places on the basaltic columns and cliffs served as backgrounds upon which pictures were made, some being pecked,⁴ others painted.⁵ No objects made of mica or nephrite were found. Siliceous sandstone was made into pestles, pipes and smoothers for arrow-shafts, but the last were rare. Copper clay, white earth and red ochre were not found, but red and white

¹ See Fig. 5 and 202-8141, p. 154.

² Spinden, p. 184.

³ Smith, (d) p. 132 and 135 (c) p. 407

⁴ See Plates XI-XIII.

⁵ See Plates XIV-XVI.

paint were seen on the basaltic cliffs and Mrs. Lynch reports blue paint from a grave near Fort Simcoe (p. 117).

Copper was used for beads, pendants and bracelets. While all of this copper may have been obtained by barter from the whites, yet some of it may have been native. Copper, according to Spinden, was probably not known to the Nez Perce before the articles of civilization had reached that region, but he states that large quantities of copper have been taken from graves and that the edges of some of the specimens are uneven, such as would be more likely to result from beating out a nugget than from working a piece of cut sheet copper.¹ The glass beads, iron bracelets,² and bangles,³ the brass rolled beads,⁴ brass pendant⁵ and the white metal inlay,⁶ which we found, all came from trade with the white race during recent times and do not belong to the old culture.

Shells of the fresh water unio, in a bed five or six feet in diameter and two or three inches thick, at the Priest Rapids village site and described on p. 34 indicate that this animal had been used for food. Shells of the little salt water clam (*Pectunculus* 202-8388, Fig. 88), haliotis (202-8234b, 8252, 8255, 8386, Figs. 89-92), dentalium (202-8178, 8156, 8163, 8173, 8177-9, 8184, 8186-89, 8192-3, 8233, 8241, 8253, 8389, Figs. 74, 117, and 118) olivella (202-8393, Fig. 87), and oyster (202-8170, Fig. 94) which were made into various ornaments must have been obtained from the coast. No shells of *Pecten caurinus* were found.

Deer bones were seen in great numbers in the earth of a village site at the head of Priest Rapids where they probably are the remains of cooking. Animal bones were made into points for arrows or harpoon barbs, awls and tubes that were probably used in gambling. Fish bones (202-8387) found in the village sites suggest that fish were used for food. No bones of the whale were found.

Antler was used for wedges, combs and as material upon which to carve. Horns of the Rocky Mountain sheep were used for digging-stick handles. Mountain sheep horns were secured by the Nez Perce who lived to the east of the Yakima region, and were traded with Indians westward as far as the Lower Columbia.⁷ No objects made of teeth were found although a piece of a beaver tooth (202-8189) was seen in grave No. 21, and Mrs. Lynch reports elk teeth from a grave near Fort Simcoe (p. 119). Pieces of

¹ Spinden, p. 190.

² See Fig. 96.

³ See Figs. 85 and 86.

⁴ See Fig. 75.

⁵ See Fig. 84.

⁶ See Fig. 128.

⁷ Spinden, p. 223.

thong, skin, fur, and feathers of the woodpecker, all of which were probably used as articles of wearing apparel, were found in the graves preserved by the action of copper salts or the dryness of the climate.

Wood was used as the hearth of a fire drill¹ and for a bow, a fragment of which is shown in Fig. 114. Sticks which had not decayed in this dry climate, marked some of the graves in the rock-slides (p. 140). Charcoal was also found in the graves and village sites. A fragment of birch bark, tightly rolled (202-8392) was found in a grave; roots were woven into baskets;² rushes were stitched and woven into mats.³

THE SECURING OF FOOD.

Points Chipped out of Stone. Many implements used in procuring food were found. In general, they are similar in character to those found in the Thompson River Region.⁴ The most numerous perhaps, were points of various sizes and shapes, made by chipping and flaking, for arrows, knives and spears. Many of these are small and finely wrought and most of them are of bright colored agates, chalcedonies and similar stones. As before mentioned, several small quarries of such material with adjacent workshops were found. A very few specimens were made of glassy basalt, and it will be remembered (p. 21) that this was the prevailing material for chipped implements in the Thompson River region to the north, where there was perhaps not such a great variety of material used.⁵ In the Nez Perce region to the east, according to Spinden, a great variety of forms of arrow points chipped from stone of many kinds is found,⁶ and the extreme minuteness of some of them is noteworthy. The war spear sometimes had a point of stone, usually lance-shaped, but sometimes barbed.⁷ He further states that iron supplanted flint and obsidian at an early date, for the manufacture of arrow-heads.⁸

No caches of chipped implements were found in the Yakima region. Judging from the collections which I have seen, I am under the impression that chipped points are not nearly so numerous in this region as they are near The Dalles and in the Columbia Valley immediately south of this area,

¹ See Fig. 38.

² See Fig. 17.

³ See Fig. 70-72.

⁴ Smith, (d) p. 135; and (c) p. 408.

⁵ *Ibid.*

⁶ Cf. Spinden, Figs. 10-22, Plate VII.

⁷ Spinden, p. 227.

⁸ Spinden, p. 190.

and perhaps not even as numerous as in the Thompson River country to the north. We found no fantastic forms such as were rather common in the Thompson River country.¹ It will be remembered² that the art of chipping stone was not extensively practised on the coast of British Columbia or Washington, no specimens having been found in that area north of Vancouver Island except at Bella Coola, where only two were discovered. They were frequent at Saanich and in the Fraser Delta and became still more common as one approached the mouth of the Columbia on the west coast of Washington where, on the whole, they seem to resemble, especially in the general character of the material, the chipped points of the Columbia River Valley in the general region from Portland to The Dalles.

The range of forms and sizes is well shown in Figs. 1 to 6 and in Plates I and II.³ The specimen shown in Fig. 1 is very small, apparently made from a thin flake of chalcedony that has not been much chipped. Its edges



Fig. 1 (202-8369).
Chipped Point made
of Chalcedony. From
the surface, near the
head of Priest Rapids.
½ nat. size.

are slightly serrated and it was found on the surface near the head of Priest Rapids. Deeply serrated points are found in the Nez Perce region to the east, but they are unusual.⁴ The one shown in Fig. 2 is also made of chalcedony and is from the same place. It is larger and the barbs are not so deep. The specimen shown in Fig. 3, chipped from white chalcedony was found at the same place and may be considered as a knife point rather than as an arrow point. The one shown in Fig.

4 is made of petrified wood and has serrated edges.

It was found at Priest Rapids and is in the collection of Mr. Mires. Fig. 5 illustrates a point with a straight base chipped from obsidian, one of the few made of this material that have been found in the whole region. This is also from Priest Rapids in the collection of Mr. Mires. The straight based arrow-head is very common in the Nez Perce region.⁵ The specimen shown in Fig. 6 is leaf shaped, the base being broken off. It is made of chert, was collected at Wallula near the Columbia River in Oregon by Judge James Kennedy in 1882 and is in the James Terry collection of this Museum. Plate I shows a rather large and crudely chipped point made of basalt, from the surface near the head of Priest Rapids on the bank of the Columbia River. The second is made of red jasper and the third of white chert. They were found near the head of Priest Rapids, the latter also on

¹ Smith, (d) p. 136; and (c) p. 409.

² Smith, (b), p. 437; (a) p. 190; (e) p. 564; and (f), p. 359.

³ Photographs by Mr. Wm. C. Orchard.

⁴ Cf. Spinden, Fig. 16, Plate VII.

⁵ Cf. Spinden, Fig. 14, Plate VII.

the bank of the river. These three specimens may be considered as finished or unfinished spear or knife points. The specimens shown in Plate II are more nearly of the average size. The first is made of buff jasper and was found on the surface at Kennewick. It is slightly serrated. The second is made of brownish fissile jasper and was found in grave No. 10 (5) in a rock-slide near the mouth of the Naches River. The third, chipped from mottled quartz was found in grave No. 28 (21) near the skull in a rock-slide about three miles west of the mouth of Cowiche Creek. The fourth of white quartzite is also from grave No. 28 (21) near the skull. The breadth of the base of these last two specimens and the notches would facilitate their being fastened very securely in an arrow-shaft, while the basal points would probably project far enough beyond the shaft to make serviceable barbs.



Fig. 2.

Fig. 3.



Fig. 4.

Fig. 2 (202-8364). Chipped Point made of Chalcedony. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 3 (202-8336). Chipped Point made of White Chalcedony. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 4. Serrated Chipped Point made of Petrified Wood. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. Mires.)

The fifth specimen, chipped from brown chert was found among the refuse of a fire in grave No. 1, in a rock-slide of the Yakima Ridge. The sixth is made of glassy basalt and is remarkable for having two sets of notches. It is rather large, which suggests that it may have served as a knife point. It is from the head of Priest Rapids and was collected and presented by Mrs. J. B. Davidson. Double notched arrow points are found in the Nez Perce region.¹ The seventh is chipped from pale fulvous chalcedony and is from the surface at the same place. The eighth is chipped from similar material and was found near by. The ninth is made of opaline whitish chalcedony and is from the same place. The tenth is chipped from yellow agate, and somewhat resembles a drill, while the eleventh is of brown horn stone, both of them being from the surface near the head of Priest Rapids.

¹ Cf. Spinden, Fig. 15, Plate VII.

The twelfth which is chipped from clove brown jasper was found on the surface of the Cherry Creek camp site near Ellensburg. The thirteenth is made of reddish white chert and was found on the surface near the mouth of Wenas Creek. The fourteenth is of pale yellow chalcedony and comes from the surface near the head of Priest Rapids. Most of these specimens seem to be suitable for arrow points, although some of them probably served for use as knives.

Points Rubbed out of Stone. No points rubbed out of stone have been found in this region, although it will be remembered that two such points



Fig. 5.

Fig. 5. Chipped Point made of Obsidian. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. Mires.)

Fig. 6.

Fig. 6. (T-21184, H 180.) Fragment of a leaf-shaped Point made of Chert. From Wallula near the Columbia River, Oregon. Collected by Judge James Kennedy in 1882. $\frac{1}{2}$ nat. size.

were found in the Thompson River region ¹ and were thought to represent an intrusion from the coast where they were common as in the Fraser Delta ² at both Port Hammond and Eburne where they are more than one half as numerous as the chipped points, and at Comox ³ where at least seven of this

¹ Smith, (c), p. 409.

² Smith, (a), pp. 141 and 143.

³ Smith, (b), p. 308.

type to three chipped from stone were found. They were also found at Saanich,¹ where they were in proportion of nineteen to twenty-four, near Victoria² and on the San Juan Islands.³

Points Rubbed out of Bone. Points rubbed out of bone which were so common on the coast everywhere, but rare in the Thompson River country are still more scarce here. Only ten specimens from the whole region can be identified as clearly intended for the points or barbs of arrows, harpoon heads or spears. The types are shown in Figs. 7 to 12. The first was found in the west, northwest part of grave No. 10 (5) in a rock-slide about a half mile above the mouth of the Naches River. It is nearly circular in cross section, 31 mm. long with a point only 6 mm. in length and was apparently intended for a salmon harpoon head, similar to those used in the Thompson River region⁴ both in ancient and modern times but which are much more common on the coast. The specimen shown in Fig. 8 is circular in cross section and was seen in the collection of Mrs. Davidson. It is from Kennewick and is of the shape of one of the most frequent types of bone points found in the Fraser Delta.⁵ The specimen shown in Fig. 9 was found with three others in grave No. 1 in a rock-slide of the Yakima Ridge. This and two of the others were scorched. They are circular in cross section and sharp at both ends but the upper end is much the more slender. The point shown in Fig. 10 somewhat resembles these, but it is slightly larger and tends to be rectangular in cross section except at the base. It was found with a similar specimen in a grave on the Snake River, five miles above its mouth, and was collected and presented by Mr. Owen who still has the other specimen. Diagonal striations may still be seen on its much weathered brown surface. These were probably caused by rubbing it on a stone in its manufacture. A slightly different type of bone point is shown in Figs. 11 and 12. These seem to be barbs for fish spears such as were found in the Thompson River region,⁶ among both ancient and modern specimens. The one shown in Fig. 11 has traces of the marrow canal on the reverse. It was found in the Yakima Valley below Prosser and is in the collection of Mr. Spalding. While the specimen shown in Fig. 12 is from the surface near the head of Priest Rapids.

Bone points and barbs were used in the Nez Perce region to the east, where three types of spears with bone points were known, two of them at least being similar to those found in the Thompson River region to the

¹ Smith, (b), p. 332.

² P. 357 and 358, *ibid.*

³ P. 380, *ibid.*

⁴ Smith, (c), p. 410; Telt, (a), Fig. 231.

⁵ Cf. Smith, (a), Fig. 13h.

⁶ Smith, (c), p. 410; Telt, (a), Fig. 232.

**Fig. 7.****Fig. 8.****Fig. 9.****Fig. 10.****Fig. 11.****Fig. 12.**

Fig. 7 (202-8165). Point made of Bone. From the W., N. W. part of grave No. 10 (5) in a rock-slide about half a mile above the mouth of Naches River. $\frac{1}{4}$ nat. size.

Fig. 8. Point made of Bone. From Kennewick. $\frac{1}{4}$ nat. size. (Drawn from a sketch. Original in the collection of Mrs. Davidson.)

Fig. 9 (202-8143). Scorched Point made of Bone. From grave No. 1 in a rock-slide of the Yakima Ridge. $\frac{1}{4}$ nat. size.

Fig. 10 (20.0 1468). Point made of Bone. Found in a grave on an island in the Snake River, five miles above its mouth. $\frac{1}{4}$ nat. size. (Collected and presented by Mr. Owen.)

Fig. 11. Point or Barb made of Bone. From the Yakima Valley below Prosser. $\frac{1}{4}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. Spalding.)

Fig. 12 (202-8381). Point or Barb made of Bone. From the surface, near the head of Priest Rapids. $\frac{1}{4}$ nat. size.

north.¹ The war spears sometimes had a point of bone, usually lance-shaped, but sometimes barbed.²

Bows. The only information which we have regarding bows is from the specimen shown in Fig. 114. The object seems to be a fragment of a bow which was lenticular in cross section although rather flat. It is slightly bent and the concave side bears transverse incisions. (p. 125.) The specimen was found in grave No. 10 (5) in a rock-slide about one hundred and fifty feet up the slope on the north side of the Naches River, about half a mile above its mouth. The presence of several perishable objects in the grave suggest it to be modern, but no objects of white manufacture were found. This is the only object indicating the sort of bow used in this region and with the exception of the chipped points previously described, some of which were undoubtedly for arrows, is the only archaeological object tending to prove the use of the bow. It will be remembered³ that fragments of a bow of lenticular cross section ornamented with parallel irregularly arranged cuneiform incisions, were found in a grave near Nicola Lake in the Thompson River region and that pieces of wood, some of which may have been part of a bow, were found in a grave at the mouth of Nicola Lake; also that pieces of wood found at Kamloops resemble a bow of the type shown in Fig. 220 of Mr. Teit's paper on the present Thompson Indians.⁴

In the Nez Perce region to the east, war clubs with heads made of unworked river boulders, according to Spinden,⁵ were sometimes used in killing game and such may have been the case in this region.

Snares. Fragments of thongs, skin, fur and woodpecker feathers merely suggest methods of hunting or trapping which are not proven by any of our finds. It is barely possible although not probable that the bone tubes considered to have been used in gambling and illustrated in Figs. 97 and 98 and also the perforated cylinder of serpentine shown in Fig. 99 may be portions of snares. Traps and snares of various kinds were common among the Indians of the larger plateau area of which this is a part.⁶

Mr. J. S. Cotton informs me that in the vicinity of Mr. Turner's home, Section 6, Town north 18, Range 40 east, on Rock Creek, about six miles below Rock Lake, and in the vicinity of the graves described on p. 140 and the so-called fort mentioned on p. 82, there is a long line of stones running from Rock Creek in a southeasterly direction across the coule to a small draw on the other side. This chain of rocks is about five miles long. The stones

¹ Spinden, p. 189 and Fig. 5^s, 10, 11.

² Spinden, p. 227.

³ Smith, (c), p. 411.

⁴ Teit, (a), Fig. 216.

⁵ Spinden, p. 188 and 227, also Fig. 5^s.

⁶ Lewis, p. 182.

have evidently sunk into the ground and show signs of having been there a long time. They have been in the same condition since about 1874 when first seen by the whites, even the oldest Indians claiming to know nothing about them. According to Lewis, game was surrounded and driven in by a large number of hunters or was run down by horses, in the great area of which this is part.¹ It seems altogether probable that a line of stone heaps may have been made to serve either as a line of scarecrows, possibly to support flags or similar objects, which would have the effect of a fence to direct the flight of the game or as a guide to enable the hunters to drive the game towards a precipice where it would be killed, or a corral where it would be impounded.

Notched Sinkers. Sinkers for fish nets or lines were made of disk-shaped river pebbles. A pebble and the different types of sinkers are shown in Fig. 13. These were numerous on the surface of the beach of the Columbia River near the head of Priest Rapids. They have two or four notches chipped from each side in the edges. When there are two, the notches are usually at each end; when there are four, they are at the end and side edges. Sometimes, the notches are so crudely made that the edge of the pebble is simply roughened so that a string tied about it at this place would hold. One of these sinkers from Priest Rapids was seen in Mr. Mires' collection.

Grooved Sinkers. Some large thick pebbles have grooves pecked around their shortest circumference. They may have been used as canoe smashers or anchors, but seem more likely to be net sinkers. Two of these are shown in Figs. 14 and 15. They are from Priest Rapids and are in the collection of Mr. Mires. Both are battered along the lower edge, from the groove on the left to within a very short distance of it on the right and over a considerable portion of the edge of the top. In the second specimen, this battering forms a considerable groove on the lower edge, but a groove only the size of those shown in the illustration on the upper edge. This battering suggests that they may have been used as hammers, but the battered ends of hammers are not often grooved. There are certain grooves pecked on one side of each which seem to be of a decorative or ceremonial significance and are consequently discussed on p. 132 under the section devoted to art. The first specimen is made of granite or yellow quartzite with mica, the second is of granite or yellowish gray quartz with augite and feldspar. One specimen similar to these two, but without any decoration or grooving (202-S116) was found by us on the beach at Kennewick as was also a large pebble grooved nearly around the shortest circumference (202-S332) at Priest Rapids. One object of this type made of a boulder but grooved around the longest

¹ Lewis, p. 182; Ross, (a), p. 316; De Smet III, p. 1026; Lewis and Clark, IV, p. 371.



Fig. 13.

Fig. 14.

Fig. 13 *a* (202-8296), *b* (202-8318), *c* (202-8313), *d* (202-8330). Pebble and Net Sinkers made of Pebbles. From the surface of the bank of Columbia River, near the head of Priest Rapids. $\frac{1}{4}$ nat. size.

Fig. 14. Sinker, a Grooved Boulder bearing a Design in Intaglio. From Priest Rapids. $\frac{1}{4}$ nat. size. (Drawn from photograph 44536, 9-2. Original in the collection of Mr. Mires.)

circumference was seen in Mr. Owen's collection. It was found on the bank of the Columbia River two miles below Pasco. The specimen described on p. 60 which has a notch pecked in each side edge and is battered slightly on one end may have been used as a net sinker, although it has been considered a hammer. This specimen (202-8214) in a way resembles the small flat notched sinkers except that the notch is pecked instead of chipped and that it is larger and thicker in proportion. Other specimens which are considered as net sinkers, anchors or "canoe smashers" instead of being grooved, are perforated by a hole which tapers from each side and has apparently been made by pecking. Sometimes this hole is in the center, while in other cases it passes through one end. Fig. 16 illustrates such a specimen. It was found at Priest Rapids and is in the collection of Mr. Mires. It is made from a river pebble of yellowish-gray volcanic rock. The perforation is in the broadest end. A similar specimen perforated near one end and one pierced near the middle were seen in Mr. Owen's collection. He believes that these were used for killing fish, an Indian having told him that such stones were thrown at the fish and retrieved with a cord which was tied through the hole. Probably all of these were sinkers for nets or at least anchors for the ends of nets, set lines or for small boats.

Sinkers were not seen by us among archaeological finds in the Thompson River region but Mr. James Teit has informed the writer of their use there on both nets and lines, particularly on the former. Nets, excepting the bag net, were very little used in the Kamloops-Lytton region along the Thompson River and that may account for a scarcity of sinkers among archaeological finds. Nets were more extensively used on the Fraser River, but were very much used near large lakes and consequently one would expect to find sinkers in the vicinity of such places as Kamloops, Shushwap, Anderson, Seaton, Lillooet, Nicola, Kootenay and Arrow Lakes. Now, as the Shushwap generally made little bags of netting in which they put their sinkers to attach them to nets, this would greatly militate against the finding of grooved, notched or perforated sinkers in the Shushwap part of this region. They probably thought this method was more effective or took up less time than notching, grooving or perforating stones, and attaching lines to them. It is unknown which of these methods is the most primitive. Unworked pebbles, chosen for their special adaptation in shape, and others grooved or perforated were used in some parts of the interior of British Columbia for sinkers which were not enclosed in netting. Unworked pebbles attached to lines have been seen in use among the Thompson River Indians by Mr. Teit who sent a specimen of one to the Museum.¹ These were of various

¹ Teit, (a). Fig. 234.

Fig. 15.

Fig. 16.

Fig. 15. Sinker, a Grooved Boulder bearing a Design in Intaglio. From Priest Rapids. $\frac{1}{4}$ nat. size (Drawn from photograph 44536, 9-2. Original in the collection of Mr. Mires.)

Fig. 16. Sinker, a Perforated Boulder. From Priest Rapids. $\frac{1}{4}$ nat. size. (Drawn from photograph 44536, 9-1. Original in the collection of Mr. Mires.)

shapes, some of them being egg-shaped. A deeply notched oval pebble was found on the site of an old semi-subterranean winter house on the west side of Fraser River at the mouth of Churn Creek in the country of the Fraser River division of the Shushwap. The Thompson Indians said it had been intended for a war ax and accordingly one of them mounted it in a handle. It is now cat. No. 16-9073 in this Museum. Mr. Teit believes the stone to be too heavy for a war club of any kind and that possibly it may originally have been a sinker, although it is chipped more than necessary for the latter. In 1908, he saw a perforated sinker found near the outlet of Kootenay Lake, on the borders of the Lake division of the Colville tribe and the Flat-bow or Kootenay Lake branch of the Kootenay tribe. It was made of a smooth flat water-worn beach pebble 132 mm. long by 75 mm. wide and 25 mm. thick. The perforation was drilled from both sides near the slightly narrower end and a groove extended from it over the nearest end where it formed a notch somewhat deeper than the groove. Mr. Teit heard that several such sinkers had been picked up around Kootenay Lake and also along the Arrow Lakes of the Columbia River on the borders of the Shushwap and Lake divisions of the Colville tribe.

In the Nez Perce region ¹ to the east, no sinkers were used with fish lines, but roughly grooved river boulders were employed as net sinkers.² A grooved sinker has been found at Comox, grooved stones which may have been used as sinkers occur at Saanich, on the west coast of Washington and the lower Columbia. On the coast of Washington some of them have a second groove at right angles to the first which in some cases extends only half way around; that is, from the first groove over one end to meet the groove on the opposite side. One of the specimens found at Saanich was of this general type. Perforated specimens have been found in the Fraser Delta,³ at Comox,⁴ at Saanich,⁴ Point Gray,⁴ Marietta,⁴ at Gray's Harbor and in the Lower Columbia Valley. On the whole, however, sinkers are much more numerous in the Yakima region than on the Coast. The fish bones which were found, as mentioned under resources, tend to corroborate the theory that the notched, grooved and perforated pebbles were net sinkers and that the bone barbs were for harpoons used in fishing.

Shell Heaps. Small heaps of fresh water clam shells, as before mentioned among the resources of the region on p. 22, were seen; but these being only about five feet in diameter and two or three inches thick are hardly comparable to the immense shell heaps of the coast. These fresh water

¹ Spinden, p. 210.

² Spinden, pp. 188 and 211.

³ Smith, (a), Fig. 22.

⁴ Smith, (b), p. 311, 338, 362, 369.

shells were probably secured from the river near by, where such mollusks now live. Shell fish probably formed only a small part of the diet of the people although dried sea clams may have been secured from the coast by bartering. The objects made of sea shell mentioned among the resources of this region as probably secured from the coast through channels of trade, suggest that the same method was employed for obtaining certain food products from a distance. In fact, Lewis and Clark inform us that the tribes of this general region carried on considerable trade with those of the lower Columbia. Shell heaps of this character, however, are found in the Nez Perce region. Spinden¹ states that no shell heaps except of very small size are found, but occasionally those of a cubic foot or more in size are seen in the loamy banks of the rivers, noting a few near the junction of the South and Middle forks of Clearwater River, and also near the confluence of the North fork with the Clearwater. These seem to be the remains of single meals that had been buried or cast into holes.

Digging Sticks. The gathering of roots is suggested by the presence of digging stick handles. One of these (Fig. 126) is made of the horn of a rocky mountain sheep and was secured from an Indian woman living near Union Gap below Old Yakima. The perforation, near the middle of one side for the reception of the end of the digging stick, is nearly square but has bulging sides and rounded corners. The smaller end of the object is carved, apparently to represent the head of an animal. Similar handles, some of them of wood, others of antler and with perforations of the same shape, were seen in Mr. Janeck's collection. It will be remembered that such digging stick handles made of antler were found in the Thompson River region among both archaeological finds and living natives,² the archaeological specimens being of antler, the modern handles of wood or horn.

The digging stick was one of the most necessary and characteristic implements of the Nez Perce region to the east, the handle consisting of a piece of bone or horn perforated in the middle for the reception of the end of the digging stick, or, according to Spinden, an oblong stone with a transverse groove in the middle lashed at right angles to the stick.³ No archaeological specimens which are certainly digging stick handles were found on the coast.

No sap scrapers such as were collected in the Thompson River region⁴ were identified and they have not been recognized among specimens from the coast.

Basketry. The gathering of berries as well as of roots is suggested by

¹ Spinden, p. 177.

² Smith, (d), p. 137; (c), p. 411; Telt, (a), p. 231.

³ Spinden, p. 200, Fig. 33, Plate VII.

⁴ Smith, (c), p. 411.

fragments of baskets which have been found. One of these is shown in Fig. 17.

Fig. 17 (202-8161).
Fragment of Coiled Basket of Splint Foundation and Bifurcated Stitch. From grave No. 10 (5) in a rock-slide about half a mile above the mouth of Naches River. $\frac{1}{2}$ nat. size

It was found in grave No. 10 (5) in a rock-slide about a half mile above the mouth of the Naches River. It is coiled with splint foundation and bifurcated stitch. Judging from other baskets of the same kind, it was probably once imbricated. This type of basketry is widely distributed towards the north and with grass foundation is even found in Siberia.¹ Commonly the coiled basketry in the Nez Perce region to the east was made with bifurcated stitch,² by means of a sharpened awl which was the only instrument used in weaving it. Some were imbricated, although this style has not been made for many years, and only a few of the older natives remember women who could make them.³ Some similar basketry of a finer technique was found with this fragment.

PREPARATION OF FOOD.

Mortars. Mortars made of stone for crushing food, such as dried salmon, other meat and berries, were not uncommon in this region and pestles of the same material were numerous. Flat oval pebbles were found scattered on

Fig. 18 (202-8394). Fragment of a Mortar made of Stone. From among covering boulders of grave No. 42 (4) of adult in sand at the western edge of Columbia River about twelve miles above the head of Priest Rapids. $\frac{1}{2}$ nat. size.

¹ Jochelson, p. 632.

² Spinden, 194.

³ Spinden, p. 193.

the surface of a village site on the west bank of the Columbia at the head of Priest Rapids and were probably used as lap stones or as objects upon which to crush food. A somewhat circular one (202-8295) about 230 mm. in diameter has a notch, formed by chipping from one side, opposite one naturally water-worn, which suggests that it may have been used as a sinker; but it seems more likely that it was simply an anvil or lap stone. Similar pebbles were used in the Thompson River region,¹ some of them having indications of pecking or a slight pecked depression in the middle of one or both sides. In the Nez Perce region to the east, basketry funnels were used in connection with flat stones for mortars. These funnels were of rather crude coil technique.² Another specimen (202-8292b) found at the same place is merely a water-worn boulder somewhat thinner at one end than at the other, the surface of which apparently has been rubbed from use as a mortar or milling stone. A few large chips have been broken from the thinner edge.

Fig. 19. Mortar made of Stone. From the Yakima Reservation near Union Gap. $\frac{1}{2}$ nat size. (Drawn from photograph 44455, 2-4. Original in the collection of Mr. Janeck.)

Still another specimen (202-8294) from here is a fragment of a pebble only 120 mm. in diameter with a saucer-shaped depression about 10 mm. deep, in the top.

A somewhat disk-shaped pebble of gray lava 295 mm. in diameter with a saucer-shaped depression in the top and a large pecked pit in the bottom (20.0-3344) was collected at Fort Simcoe by Dr. H. J. Spinden. A fragment of a mortar about 190 mm. in diameter with a nearly flat or slightly convex base and a depression 50 mm. deep in the top (202-8293) was found on the surface near the head of Priest Rapids and another fragment nearly twice as large, the base of which is concave over most of its surface and shows marks of pecking, apparently the result of an attempt to make it either quite flat or concave like many other mortars that have a concavity in each side, is shown in Fig. 18. It was found among the covering boulders of the grave

¹ Smith, (d), p. 139.

² Cf. Spinden, p. 194.

of an adult, No. 42(4), in the sand at the western edge of the Columbia River about twelve miles above the head of Priest Rapids. The mortar shown in Fig. 19, is hollowed in the top of a symmetrical, nearly circular pebble and has a convex base. It was found on the Yakima Reservation near Union Gap and is in the collection of Mr. Janeck.¹ This reminds us of a similar mortar found in the Thompson River region,² but such simple mortars made from pebbles are rarely found in the Nez Perce region to the east.³ The

mortar shown in Fig. 20 also from the same place and in the same collection has a nearly flat base and three encircling grooves.⁴ These grooves find their counterpart in four encircling incisions on the little mortar found in the Thompson River region.⁵

Fig. 20. Mortar made of Stone. From the Yakima Reservation near Union Gap. $\frac{1}{2}$ nat size. (Drawn from photograph 44455, 2-4. Original in the collection of Mr. Janeck.)

The specimen shown in Fig. 116, which may be considered as a dish rather than a mortar, was seen in the collection of Mrs. Hinnuan who obtained it from Priest Rapids. It is apparently of sandstone, 150 mm. in diameter, 50 mm. high, the upper part being 38 mm.

high and of disk shape with slightly bulging sides which are decorated with incised lines,⁶ the lower part being also roughly disk shaped 64 mm. by 76 mm. in diameter by about 12 mm. high with slightly convex bottom and edges curved out to the base of the upper part. There is a disk shaped dish in the top 100 mm. in diameter by 12 mm. in depth.⁷

The animal form shown in Fig. 125 bears a mortar or dish in its back. The object is 203 mm. in length, 88 mm. high and 113 mm. wide. The length of the bowl is 88 mm., the width 70 mm., and the depth 38 mm. The object is made of porous lava and was secured from an Indian who claimed to have found it in a grave near Fort Simcoe on the Yakima Reservation two miles below Union Gap which is immediately below Old Yakima.⁸

It seems strange that so many of the mortars are broken since they would

¹ Museum negative no. 44455, 2-4

² Smith, (c), Fig. 342.

³ Spinden, Figs. 20 and 22, Plate vi

⁴ Museum negative no. 44455 4-2

⁵ Smith, (c), Fig. 343.

⁶ See p. 125

⁷ Museum negative no. 44537, 9-3.

⁸ Here reproduced from photographs 44452, 2-1, 44455, 2-4, and 44503, 6-4 and the original which is catalogue no. 36 in the collection of Mr. Janeck

be hard to break. It will be remembered that one of the broken mortars came from a grave and it may be that the others were on or in graves but had been removed in some way. My general impression is that mortars are much more numerous among archaeological finds both in this region and in the interior of British Columbia than on the coast.

Pestles. In addition to the probable use of pestles with flat stones or mortars with basket funnels, some of them, especially where nearly flat or concave on the striking head as in the Thompson River region to the north and on the coast may also have been used as hammers for driving wedges, splitting wood and like industries, if indeed they were not made solely for the latter uses. Some of the pestles differ from those found either to the north or on the coast, many of them being much longer, although Mr. James Teit informs me that very long pestles are occasionally found in the Thompson River region. He has seen four, and heard of one or two more. One two feet long was found in the Nicola Valley about 1905. One of the pestles of the Yakima Valley has a top in the form of an animal hoof, as is shown in Fig. 124. Others like animal heads are shown in Figs. 31, 33-35. The range of forms of pestles is shown in Figs. 21 to 35. The specimens shown in Figs. 22 to 28 inclusive are apparently all of the shorter type, while those shown in the remaining figures are variations of the longer type. By far the greater number of pestles, about forty, are of the type shown in Fig. 21, and of these two thirds come from the vicinity of Priest Rapids. They are merely natural pebbles, all more or less of suitable size, shape and material, which have been used as pestles until one end has become flattened. Some of them are also flattened on the top, the battered ends often giving the only indication that they were used. Such as were not of exactly the right form for grasping have had their excrescences or the more projecting surfaces removed by pecking. A few of these objects seem to have been made from small basaltic columns, the corners of which have been pecked into a more suitable shape. Some of them have been pecked so that they taper gradually from the small upper end to the base. The specimen considered as a "slave-killer" and shown in Fig. 69, may have been used as a pestle. Simple short cylindrical or conoid pebbles, only slightly changed from their natural form, are used for pestles in the Nez Perce region to the east.¹

A pebble 559 mm. long by 152 mm. wide and 114 mm. thick, with rounded corners and ends, found by Mr. John Lacy near the Yakima River in North Yakima, has longitudinal grooves pecked in three sides to where they begin to round over to form the end, and a similar groove, except that

¹ Cf. Spinden, Figs. 1-4, and 8, Plate VIII.

Fig. 21.

Fig. 21 (202-8281). Pestle made of stone. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.Fig. 22 (202-8263). Pestle pecked from stone. Probably unfinished. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.Fig. 23 (202-8399). Pestle pecked from stone. Probably unfinished. From the surface, eight miles above the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 22.

Fig. 22 (202-8263). Pestle pecked from stone. Probably unfinished. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.Fig. 23 (202-8399). Pestle pecked from stone. Probably unfinished. From the surface, eight miles above the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 23.

Fig. 23 (202-8399). Pestle pecked from stone. Probably unfinished. From the surface, eight miles above the head of Priest Rapids. $\frac{1}{2}$ nat. size.Fig. 24 (202-8400). Pestle pecked from stone. Probably unfinished. From the surface, eight miles above the head of Priest Rapids. $\frac{1}{2}$ nat. size.

it is only about 101 mm. long, in the middle of the fourth side.¹ These grooves were probably made as part of a process of grooving and battering down the intervening ridges in order to bring the specimen into a desired form. Similarly grooved pebbles found on the northern part of Vancouver Island were explained to Professor Franz Boas as having been implements in such process of manufacture. So far as I am aware, Prof. Boas' announcement of this at a meeting of the American Association for the Advancement of Science was the first explanation of the sort of grooving or fluting of specimens found in northwestern America. One similar large specimen (20.0-3343) found at Lewiston, Idaho, in the Nez Perce region by Dr. H. J. Spinden, bears two longitudinally pecked grooves in addition to pecking on much of its surface. A yellowish gray boulder about 349 mm. long, nearly circular in sections and with rounded ends, from Priest Rapids, bears a pecked groove 82 mm. long by 31 mm. wide and 6 mm. deep across the middle of one side. This may have been made to cut it into the length desired for a pestle.² This specimen is much too large to be considered as the handle of a digging stick, similar to the object from the Nez Perce region considered as such by Spinden.³

The object shown in Fig. 22, one of those from the surface near the head of Priest Rapids, judging from the battered end, has apparently been used as a pestle, yet it is still apparently in process of manufacture into a form somewhat like that shown in Fig. 27. The pecking at the top is possibly the result of an attempt to remove that portion of the rock, while the transversely pecked surface seems to be a beginning towards the formation of the shaft of the pestle, whereas the longitudinal groove between these two surfaces was necessary to reduce an excrescence on the rim of what was apparently intended to be the knob at the top of the pestle. If this supposition be true, when finished, this object would have a large striking head resembling more in shape and size those of the pestles of the region near The Dalles than any yet found in this region. The specimen shown in Fig. 23 is much more clearly an unfinished pestle. The ends are pecked flat and the entire middle section has been pecked, apparently to reduce it to the desired size of the shaft. It seems that the striking head of this specimen, when finished, would be rather short. It was found on the surface eight miles above the head of Priest Rapids.

The pestle shown in Fig. 24 has a conoid body with no striking head and in this respect resembles the pestles of the Thompson River country;⁴ but

¹ In the collection of Mr. Janeck and Museum negative nos. 44453, 2-2 and 44501, 6-2.

² In the collection of Mr. Mires, and Museum negative no. 44534, 8-12.

³ Cf. Spinden, Plate VII, Fig. 33.

⁴ Smith, (c), Fig. 341.

the top is roughly disk-shaped, being neither hat-shaped nor in the form of an animal head, as are most pestles of the Thompson region nor is it exactly of the shape of the typical pestles of northern and western Vancouver Island.¹ The material is a soft gray stone which shows the marks of the pecking by means of which it was shaped.

Fig. 25 illustrates a pestle, the top of which is broken off. There are two grooves encircling the somewhat cylindrical striking head. The material

Fig. 24.

Fig. 24. Pestle made of Stone. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from photograph 44535, 9-1. Original in the collection of Mr. Mires.)

Fig. 25.

Fig. 25. Pestle made of Stone. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from photograph 44535, 9-1. Original in the collection of Mr. Mires.)

is a light blue hard porphyritic rock. These two specimens are from Priest Rapids.² The pestle shown in Fig. 26 is from the Yakima River, five miles below Old Yakima. It has a hat-shaped top and a cylindrical striking head a little larger at the top than at the bottom, is somewhat like the typical pestles of the Thompson River region,³ and is in the collection of Mr. York. Another has a slightly wider brim to the hat-shaped top, a body concave in outline and the striking head is larger at the top than at the bottom, while a

¹ Smith, (b), Fig. 126a.

² In the collection of Mr. Mires, and Museum negative no. 44535, 9-1.

³ Smith, (d), p. 138.

third has a medium sized brim, a body bulging in the middle and a long cylindrical striking head. The last two specimens are in the collection of Mr. Janeck, and are from the Yakima Valley within eight miles of North Yakima.¹

The specimen shown in Fig. 27 was found in a grave with beads and resembles the typical pestles of Lytton except that it has no nipple on the top, which is of the shape of the tops of the typical pestles of northern and western Vancouver Island. Another of nearly the same shape but less regular was found on the surface of the Yakima Valley within eight miles of North Yakima. A third specimen 234 mm. long, also found within the above mentioned limits, is made of a concavely flaring pebble. A groove is pecked part way around near the top as if to carve the knob and begin the reduction of the top of the shaft. There is also a pecked surface on one side near the base, apparently the beginning of an attempt to form a striking head by first removing irregularities. The one shown in Fig. 28 was found within eight miles of North Yakima and is of rather unusual shape, having a short striking head of the shape of the typical pestles of northern and western Vancouver Island. The slightly bulging body and exceedingly small, nearly flat knob at the top are entirely different from those of the pestles usually found in any of this area, or the country adjacent to it on the north and west. These four specimens are in the collection of Mr. Janeck.²

There are found in the Nez Perce region³ short pestles with dome-shaped tops, cylindrical bodies and rather long striking heads of the form of triangular or quadrangular prisms with rounded corners slightly larger at the top than at the bottom⁴ and such pestles with hat-shaped tops, although one has a flat top, slightly expanding shafts and long striking heads, larger at the top than at the bottom.

Fig. 29 is the first of those showing the longer type of pestle from the Yakima region. This specimen was found at Satus on the Yakima Reservation near Old Yakima and is in the collection of Mr. York. The top is somewhat spherical and the body elongated. Its conoid shape may class it with the one shown in Fig. 24. It somewhat reminds us of the pestles of the Santa Catalina Islands of California, but until we have a more definite knowledge of the forms in the vast intervening area, this resemblance must be considered as merely a coincidence, especially since long simple conoid pestles are found in the Nez Perce region to the east.⁵ A somewhat similar

¹ Museum negative no. 44454, 2-3.

² Museum negative no. 44454, 2-3.

³ Cf. Spinden, Figs. 11, 19, 21, 23, Plate VI; also Plate VIII, Figs. 10, 11.

⁴ Spinden, p. 186, Plate VIII, Fig. 9.

⁵ Cf. Spinden, Plate VI, Figs. 8-10, Plate VIII, Fig. 6.

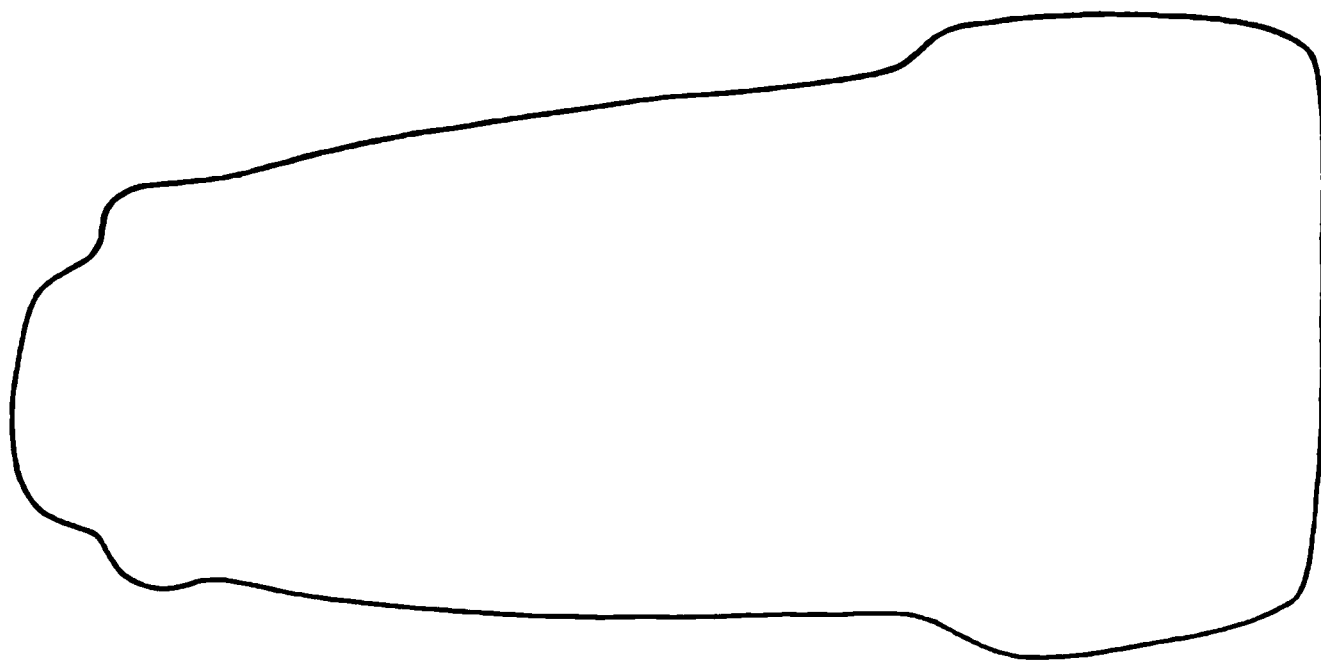


Fig. 26.

Fig. 26. Pestle made of Stone. From Yakima River five miles below Old Yakima. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. York.)

Fig. 27. Pestle made of Stone. From a grave in the Yakima Valley. About $\frac{1}{2}$ nat. size. (Drawn from photograph 44454, 2-3. Original in the collection of Mr. Janeck.)

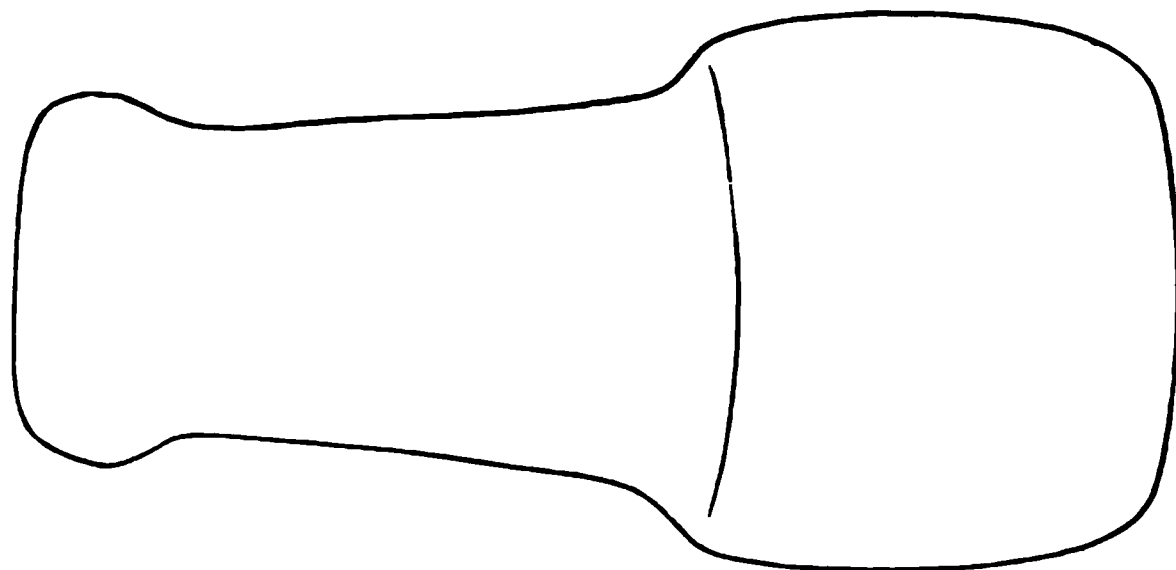


Fig. 27.

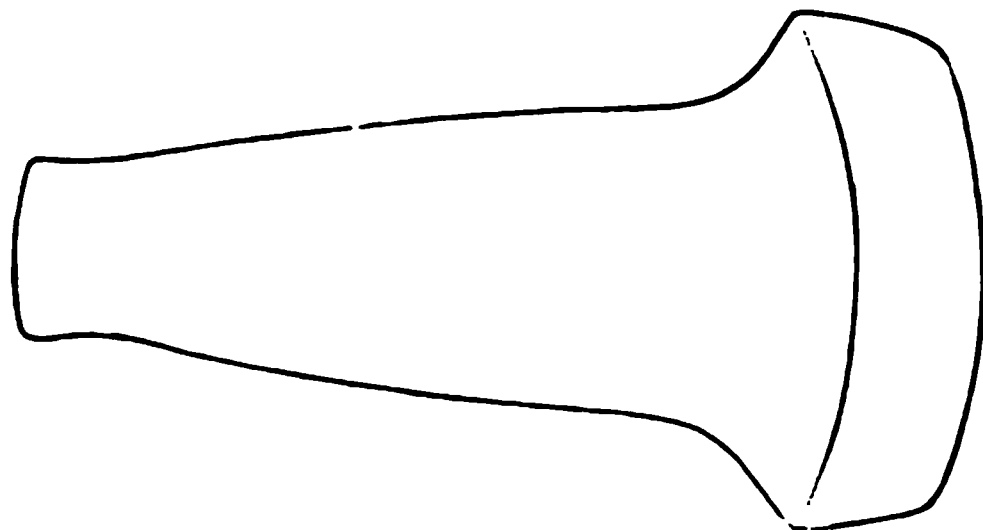


Fig. 28.

Fig. 28. Pestle made of Stone. From the surface in the Yakima Valley within eight miles of North Yakima. About $\frac{1}{2}$ nat. size. (Drawn from photograph 44454, 2-3. Original in the collection of Mr. Janeck.)

pestle in Mr. York's collection is 408 mm. long, and has a tapering body, circular in sections, a knob at the top about the size of the base and a convex striking face. It was found at Fort Simcoe.

The pestle shown in Fig. 30 is made of sandstone, was found at Priest Rapids and is in the collection of Mrs. Hinman. The shaft is a long cylinder, expanding somewhat towards the base which is only slightly convex. Like the preceding, it has no striking head. It has a hemispherical top, is unusually large and is decorated with an encircling line of circles and dots. There is also a circle and dot in the top. This decoration is again mentioned in the consideration of art on p. 130.¹

The pestle shown in Fig. 31 is 355 mm. long. It has a conoid body perhaps more pronounced than the one shown in Fig. 29 but much less typical than the one shown in Fig. 24. The top is apparently intended to represent an animal head. It is made of very hard breccia and well polished. At each side of the lower part of the body is a design made by four parallel zigzag grooves, further discussed on p. 132. It was found in the Yakima Valley, and is in the collection of Mr. Janeck.² A pestle figured by Spinden, as from the Nez Perce Indians,³ is somewhat similar to this in that it has a knob protruding slightly to one side, but there is a notch or groove made longitudinally in the top of this knob.

The pestle shown in Fig. 32 might perhaps be considered as a war club. It was found at Priest Rapids and is in the collection of Mr. Mires. The top is somewhat flat and smoothed. There is a groove around the specimen near this end. From here it constricts gradually to the lower end which is broken off. It was made from a triangular piece of gray basalt, probably a column, the natural angles and parts of the faces of which have been reduced by pecking.⁴

The specimen shown in Fig. 33 from the Yakima Valley, is in the collection of Mr. Janeck and is 630 mm. long. The top apparently represents an animal head indicated by three nipples the larger of which is interpreted as representing the nose, the others as indicating the ears. The body is of circular cross section and expands evenly to a cylindrical striking head 70 mm. in diameter by 76 mm. long.⁵

A long pestle with a knob at the top which is divided into four pyramidal or dome-shaped nipples was found at Five Mile Rapids on Snake River and was seen in Mr. Owen's collection. The next figure represents a stone pestle

¹ Museum negative no. 44537, 9-3.

² Museum negative no. 44502, 6-3.

³ Spinden, Fig. 7, Plate VIII.

⁴ Museum negative no. 44534, 8-12.

⁵ Museum negative no. 44502, 6-3.



Fig. 29.

Fig. 30.

Fig. 31.

Fig. 29. Pestle made of Stone. From Satus on the Yakima Reservation near Old Yakima. $\frac{1}{2}$ nat size. (Drawn from a sketch. Original in the collection of Mr. York.)

Fig. 30. Pestle made of Sandstone. From Priest Rapids. $\frac{1}{2}$ nat. size (Drawn from photograph 44537, 9-3. Original in the collection of Mrs. Hinman.)

Fig. 31. Pestle made of Stone. From the Yakima Valley. $\frac{1}{2}$ nat size. (Drawn from photograph 44502, 6-3. Original in the collection of Mr. Janeck.)

of somewhat similar shape but more specialized. It was found in the Yakima Valley and is in the collection of Mr. Janeck. It is 590 mm. long. The top is roughly the form of the frustum of a cone, being circular in cross section and gradually expanding downward, but it is somewhat celt-shaped, the sides for some distance being ground off nearly flat. They approach each other more closely towards the front than they do towards the back. In each of these surfaces there is an incision which represents one side of an animal's mouth and a pecked dot indicating an eye. The tip of the nose is broken off. Across the curved part behind the flat surfaces or on the back of this animal head are four incisions. Below this portion the object is circular in section until near its middle, or 178 mm. from the top, where there is a band roughly sub-pentagonal in section with rounded corners 88 mm. long. Following this band it is nearly cylindrical, being 57 mm. in diameter for 178 mm. until it expands suddenly into the striking head which is unusually bulging, 108 mm. long by 64 mm. in diameter.¹

The object 498 mm. long shown in Fig. 35 is made of steatite, material seemingly unsuited by its softness for a pestle, and may possibly be a war club. Mr. McCandless, in whose collection it is, calls the material a soft sandstone which he says is found at the head of the Wenatchie River. He says the specimen is from Lake Chelan and that he obtained it from a man above Wenatchie on the Columbia River. This man told him that he secured it from Chief Moses' tribe on Lake Chelan, and that the Indians there call it a war club and a family heirloom. The upper end is of the form of a truncated pyramid with two flat sides, two bulging edges and rounded corners. It shows peck marks and is engraved as described under art, on p. 124, and is said by the Indians to represent the head of a snake. The shaft is circular in cross section and gradually enlarges towards the base where it suddenly constricts. The specimen has been polished by the natural sand blast.²

The noise of the women at one of the Nez Perce villages, pounding roots, reminded Lewis of a nail factory.³ Beyond the Nez Perce country which bounds this area on the east, according to Spinden,⁴ the use of stone pestles disappears until the region of the Great Lakes is reached, but I have seen pestles in collections in Wyoming which are said to have been found in that state.

Rollers. Another class of specimens considered as pestles or rollers is shown in Figs. 36 and 37. These do not seem to have been used as pestles.

¹ Museum negative no. 44502, 6-3.

² Museum negative no. 44507, 6-8.

³ Lewis and Clark, V, p. 16.

⁴ Spinden, p. 187.

Fig. 32.

Fig. 33

Fig. 34.

Fig. 32. Pestle made of Stone. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from photograph 44534, 8-12. Original in the collection of Mr. Mires.)

Fig. 33. Pestle made of Stone. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44502, 6-3. Original in the collection of Mr. Juneck.)

Fig. 34. Pestle made of Stone. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44502, 6-3. Original in the collection of Mr. Juneck.)

The one shown in Fig. 36 from Priest Rapids is in the collection of Mrs. Hinman. The convex ends of this cylindrical form present the natural surface of a pebble and they are not battered. The material is a yellowish quartzite or closely allied rock. It is 457 mm. long, 75 mm. in diameter and the entire cylindrical surface has been pecked apparently to bring it to

Fig. 35.

Fig. 36.

Fig. 37.

Fig. 35. Pestle made of Steatite. From Lake Chelan. $\frac{1}{2}$ nat. size. (Drawn from photograph 44507, 6-8. Original in the collection of Mr. McCandless.)

Fig. 36. Pestle or Roller made of Stone. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from photograph 44537, 9-3. Original in the collection of Mrs. Hinman.)

Fig. 37 (202-8197). Pestle or Roller made of Stone. From the surface, about one mile east of Fort Simcoe. $\frac{1}{2}$ nat. size.

form. If it had been used as a pestle the ends would show the signs of battering or grinding. The cylindrical surface does not seem to show any signs of its having been used as a roller or grinder. It may possibly be a pestle in process of manufacture although it seems very strange that so much work should have been expended on the cylindrical surface in a region where natural pebbles very nearly of this shape were common.¹ The specimen shown in Fig. 37 is apparently made of basalt and was found on the surface about a mile east of Fort Simcoe. The ends are considerably chipped and one of them has apparently been somewhat battered since. If the object were used as a pestle the chipping of the ends is unusually great. The cylindrical surface has been formed by pecking except in one place where the natural surface shows. This bit of natural surface is such that it suggests the specimen to have been made of a prismatic basaltic column. While these two specimens may have been intended for pestles, it seems possible that they were made for rollers. Several such objects made of stone were seen in Mr. Owen's collection. He says that they were used like rolling pins for crushing camas and kouse roots in making bread. Both of these roots were extensively used in the Nez Perce region to the east.²



Fig. 38 (202-8157). Fragment of Hearth of Fire Drill. From Grave No. 10 (5) in a rock-slide about half a mile above the mouth of Naches River. $\frac{1}{2}$ nat. size.

Fish Knives. No fish knives made of slate were found, as in the Thompson River region, at Lytton,³ rarely at Kamloops,⁴ and commonly on the coast at Fraser Delta,⁵ Comox,⁶ and Nanaimo.⁷

Fire Making. The method of making fire formerly employed in this region is suggested by a fragment of the hearth of a fire drill found in grave No. 10 (5) in a rock-slide about one half a mile above the mouth of the Naches River and is shown in Fig. 38. It is made of porous wood, of light cellular structure, possibly cottonwood. This is similar to the fire drill hearths of the Thompson River region,⁸ where I have seen the Thompson River Indians make fire with the palm drill, using cottonwood root for the hearth. In the Nez Perce region to the east, also, fire was made with the palm drill, the hearth stick being of the root of the light leaved willow or the stem of "smoke wood." It was of the shape of the hearth here described. The twirling stick was made of the dead tips of red fir.⁹

¹ Museum negative no. 44537, 9-3.

² Spinden, pp. 201-203.

³ Smith, (d), p. 140.

⁴ Smith, (c), p. 414.

⁵ Smith, (a), p. 159.

⁶ Smith, (b), p. 315.

⁷ P. 345, *ibid.*

⁸ Teit, (a), p. 203.

⁹ Spinden, p. 200.

Caches. A number of small circular holes about four feet in diameter, encircled by a slight ridge, as mentioned on p. 15, were seen which are possibly the remains of ancient food caches. The Nez Perce Indians in the region to the east referred to a field at Kamiah, near the mouth of Lawyer's Creek which has the appearance of being "hilled" like an old hop field, as being the site of winter cache pits.¹

Boiling. Natural pebbles were plentiful in the river bottoms near the village sites. Such were no doubt used in boiling food in baskets or boxes, as fragments of burned and cracked pebbles were also found while pottery was entirely absent. These facts suggest that it was the custom to boil the food in baskets or even in boxes as on the coast to the west. This idea is strengthened by the fact that in the Nez Perce region to the east, watertight coiled baskets were regularly used in cooking.² We may naturally suppose that roasting before open fires was also customary in this region. No fireplaces such as were probably used in this area and are found in the Nez Perce region,³ were recognized by us, although beds of clam shells previously mentioned, may indicate the sites of ancient hearths.

HABITATIONS.

Semi-subterranean House Sites. Sites of ancient semi-subterranean winter houses, modern lodges and what may possibly have been a shell heap were seen and photographed by us in this region. Two of the examples of the remains of semi-subterranean house sites found here, as shown in Fig. 2, Plate IV, had stones on top of the surrounding embankments. Although on the top of the embankments of the remains of similar underground winter houses in the Thompson River region,⁴ we saw no stones other than those of the soil. I am informed by Mr. James Teit that such are occasionally to be found there also, but that these stones are generally found only in those places where boulders were removed during the excavation for the houses. He was told that it was the custom to place these boulders around the base of the house. Two semi-subterranean winter house sites, as mentioned on pp. 7 and 15, may be seen on the flat along the north side of the Yakima River about a mile below the mouth of the Naches. One of these may be seen in Fig. 2, Plate III.⁵ There are water-worn boulders in and on the

¹ Spinden, p. 181.

² Spinden, pp. 190 and 194.

³ Spinden, p. 178.

⁴ Smith, (d), p. 140 and Fig. 2, Plate XIII; (c), p. 414.

⁵ Museum negative no. 44517, 7-7 from the north. Negative no. 44518, 7-8 shows the same from the northwest.

embankments surrounding them. These boulders were probably uncovered during the excavation for the house. The holes are situated within twenty-five feet of the river and between it and the Yakima Ridge which rises by perpendicular cliffs, almost immediately behind these winter house sites. In fact, the photograph reproduced in the figure was taken from the hill side north of the pit and just up stream from the cliffs. They are on a little terrace about three feet high which gives them the appearance of having been connected by a ridge. The hole shown in the figure measured from the top of the ridge was nine feet deep. The top of the bank measured at points on the flat between it and the river, up stream from it, and between it and the hill, was four feet, two feet, and two feet, four inches, respectively. Averaging these measurements, the height of the embankment above the level is thirty-three and one third inches. The hole was so near the level of the river, and was so deep that when we visited it on June 18, 1903, which was during high water, the waters of the Yakima had soaked through the terrace and were about two feet deep in the bottom of the hole where it was about eight feet in diameter, measuring north and south. Measuring in the same direction the diameter of the top of the hole from points inside of the surrounding ridge was twenty-two feet, from points on top thirty-three feet, from points outside forty-seven feet, and from points outside of the wash from the ridge fifty-one feet. These measurements give us twelve and a half feet as an approximate width of the ridge or fourteen and a half feet if we measure from the bottom of the wash. The two sites mentioned on pp. 7 and 16 were also examined and photographed by us. One is plainly shown from the north of west in Fig. 2, Plate IV. They are located on a high terrace on the north side of the Naches River about one and a half miles above its mouth. There are angular rocks on each encircling ridge. Some of the large angular rocks found on the embankment of this ridge, may also have been dug out during the excavation for the house if such rocks are found under the surface of the soil in this terrace. Similar rocks are scattered about on the surface so thickly that it must have been necessary to remove a number of them from the site where the house was to stand and possibly others that were scattered about may have been put up around the base of the house in order to clear the immediate vicinity especially since many of them are disagreeably sharp angular fragments.¹

Measuring the site best shown in the figure, east and west, the level floor inside the extreme wash from the ridge is nine feet in diameter, the rocks fallen from the ridge thirteen feet, the inner edge of the ridge 20 feet, the

¹ These two sites are represented by Museum negatives nos. 44481, 4-6 reproduced in the figure; 44491, from the west; and 44492, 5-5 nearer from the west.

points on the top of the embankment, twenty-five and a half feet; the outside of the rocks, thirty feet; the extremes of the embankment thirty-five feet. These measurements north and south are respectively, nine feet, thirteen and a half feet, sixteen and a half feet, twenty-one feet, twenty-five and a half feet and thirty-three feet. Judging from these measurements, the original dimensions were probably thirty feet by twenty-five and a half feet over all, twenty-five and a half feet by twenty-one feet for the top of the embankment, twenty by sixteen and a half feet for the inside of the embankment and sixteen and a half feet by fifteen feet for the bottom of the floor. These measurements are also east and west and north and south respectively. The present depth of the hole below the top of the rocks is twenty-nine inches and from the top of the earth embankment is twenty-six and twenty-one inches. The measurements were taken east and west and north and south respectively. The slope of the hill from north to south and its attendant wash, of course, affect the north and south measurements, while the east and west measurements are probably near the original dimensions. Contiguous to this hole on the south, or in the sage brush to the right in the figure, is the other site. It is on the slope of the hill and not so clearly shown in the Plate. This hole measures ten and a half feet by eleven feet across the level floor inside; thirteen by fourteen feet inside of the rocks; nineteen by eighteen feet at the top of the embankment twenty-three by twenty-three feet outside of the rocks; and twenty-seven by twenty-six feet outside of the embankment; fourteen and eighteen inches in depth from the top of the rocks and ten and twelve inches from the top of the earth, the measurements being taken east and west and north and south respectively.

Mr. G. R. Shafer informed me that there were holes, the remains of old houses on the flat in the Naches Valley, twelve miles above the Nelson Bridge which crosses the river a short distance above the mouth of Cowiche Creek. At Fort Simcoe, immediately south of the Indian agency, on the north edge of "scab land" overlooking a small ravine as mentioned on p. 8, is a large pit surrounded by an embankment of earth, the remains of a winter house site. This hole is so deep and the embankment is so high that both Mrs. Lynch and the Indians call it a fort. About fifteen miles above Kennewick on the eastern side of the Columbia River, according to Mr. D. W. Owen, there were the remains of hundreds of semi-underground winter houses and we saw several large and deep sites immediately below Mr. Craig's house above Priest Rapids as mentioned on page 20.

A semi-subterranean winter house, with an entrance through the roof, seen by Lewis and Clark ¹ on the north side of the Columbia near the mouth

¹ Lewis, p. 185; Lewis and Clark, IV, p. 280.

of White Salmon River, was uninhabited at that time (1805). As described, it does not differ from the winter house of the Thompson Indians. The Chinook, so far as we know, never erected such houses. The pit of an underground house, according to Clark ¹ was found among the Nez Perce. Gibbs ² mentions what were probably similar pits on the Lower Yakima. Kane ³ describes a somewhat similar house used by the Walla Walla but much ruder. Such houses were used by the Klamath.⁴

Not far from the ranch of Mr. Frank Turner on Rock Creek about six miles below Rock Lake on Section 6, Town 18 north, Range 40 east in the country locally known as "The Rocks," there are two pits that are supposed to be the remains of houses which with other remains (pp. 29, 82, 140) have been in their present condition since about 1874 when they were first seen by the whites. Both the pioneers and the old Indians are said to know nothing about them. Mr. Turner's place is best reached from Sprague on the Northern Pacific Railroad, although his Post Office is Winona. My information regarding these two pits is from Mr. J. S. Cotton, then in charge of cooperative range work in Washington.

It is quite possible as pointed out by Lewis ⁵ that the introduction of the buffalo skin covered lodge which probably came after the advent of the horse into this region, had something to do with the apparent scarcity of the semi-subterranean winter house in the Yakima region in historic times, the buffalo skin lodge possibly having taken the place of the earth-covered dwellings.

The so-called cremation circles near Cherry Creek and near the mouth of the Naches which were mentioned on pp. 12 and 15 and described on pp. 163 and 157, may be the remains of small houses of the type of semi-subterranean winter house sites that were made especially as grave houses. As before mentioned, this type of semi-subterranean circular lodge is found as far north as the Thompson River country, and I have seen one site on the prairie near Rochester, Thurston Co., probably of this type. In the Nez Perce region to the east, remains that appear like those of semi-subterranean houses consisting of ridges of earth about a foot above the general level of the ground, surrounding a circular pit, from three to five feet deep, measuring from the top of the ridge; and about seventy feet in diameter, are found near the mouth of Tammany Creek on the east bank of Snake River, a few miles above Lewiston. The site may be identified with Hasutin.⁶ The place

¹ Lewis and Clark, V, p. 35.

² Gibbs, (a), p. 409.

³ Kane, p. 272.

⁴ Gatschet, pp. 177, 124; Abbott in the Pacific Railroad Report, VI, p. 69.

⁵ Lewis, p. 186.

⁶ Spinden p. 179.

is known to have been used as a camp until about 1878, especially during the season of lamprey eel fishing. These house rings are in several groups. A little charcoal, some unio shell, flint chips, a digging stick with a bone handle, glass beads and other objects are reported to have been found in them. Somewhat similar house rings about twenty-five feet in diameter were found on the south bank of the Middle fork of Clearwater River, near the town of Kooskia. Spinden¹ refers to Lewis and Clark² for evidence of considerable antiquity for the circular house rings in this Nez Perce region. They mention one as being about thirty feet in diameter with a rim over three feet high and the floor sunken four feet below the surface of the ground or seven feet below the top of the rim. The Mountain Snakes, according to Ross³ never used underground houses.

At the site near Kooskia there is another type of house site such as I have not seen in the Yakima, Thompson or Coast regions. Spinden describes them as long and narrow, about sixty to eighty-five feet long by eighteen feet wide. The interior is sunken from one to three feet and surrounded by well marked elevated rims. As a rule, these pits are not so deep or clearly marked as those of the circular type. The axis of the house is parallel with the river. He states that these house sites have not been used for a long time and that trees, some of which are eighteen inches in diameter grow directly out of them. Excavation revealed a number of fireplaces about twelve feet apart along the axis of these houses suggesting that they were communal lodges.⁴ We discovered no indications of communal dwellings in the Yakima region.

Circles of Stones (Summer House Sites). A circle of stones which marked a small lodge site was examined and photographed. The stones were no doubt cleared from the interior and all or part of these possibly with others, were no doubt used to hold down the lodge covers. Although I saw no such circle of stones in the Thompson River region I am informed by Mr. Teit that they are occasionally to be seen there and that they represent old lodge sites. The circle of stones above-mentioned as described on p. 15 was found on a terrace somewhat lower than the one on which were situated the remains of the two semi-subterranean houses described on p. 52. This terrace is a few yards down stream from the one on which they stand, and is separated from it by a small ravine. The site is a little further down the stream and towards the southeast. It is shown in Fig. 1, Plate IV,⁵ from

¹ Spinden, p. 197.

² Lewis and Clark, V, p. 33.

³ Ross, (b), II, p. 117.

⁴ Spinden, p. 197.

⁵ Museum negative no. 44482, 4-7 from the north.

the point on the hillside a few feet above it to the north, shown on the lower end of the slope in Fig. 2, Plate IV and in negative nos. 44491, 5-4, and 44492, 5-5. This circle of stones on the level ground was made up of angular rocks such as are scattered on the immediate surface. It measures ten by eleven feet in diameter inside; fifteen by seventeen feet from the top of the circle; and twenty-two by twenty-three feet over all. The top of the highest stones was from fourteen to twelve inches above the middle of the space enclosed which as before stated, seemed to be on a level with the outside, all measuring being east to west and north to south respectively. Among the rocks was found a chipped piece of jasper or brown chalcedony.

No saucer-shaped depressions were seen in the Yakima region, although it is quite probable that they formerly existed and have been obliterated by weathering. It will be remembered that such saucer-shaped depressions are often made by sweeping out the summer lodges in the Thompson River region ¹ and that they marked the sites of such houses.

Two summer lodges photographed ² by us near Ellensburg which were mentioned on page 12 and the one seen below Union Gap down stream from Old Yakima, resemble those of the Thompson River region to the north. It will be remembered that mat covered tipis are found in the Nez Perce region to the east.³ Lewis and Clark ⁴ mention but one buffalo skin lodge among the Nez Perce in 1806 and that was apparently reserved for special occasions, but a few years later this type of lodge had practically supplanted the mat lodge among that tribe and was in common use among all the interior Salish and Sahaptin tribes. The mat houses of the Yakima are mentioned by Gibbs in the Pacific Railroad Reports.⁵

A pile of stones shown in Fig. 2, Plate V ⁶ and mentioned on p. 20 as uncovered by the wash of the flood waters of the Columbia, was seen on the bottom-lands on the western side of the Columbia, south of Sentinel Bluffs and within a hundred feet north of the house of Mr. Britain Everette Craig. It is possible that this may have been a house hearth or ancient cooking place, although the presence of human bones among these stones, suggests that it was a grave covered with flat oval river pebbles. Near by, uncovered by the same wash, was a small patch of fresh water unio shells shown from the west

¹ Smith, (c), p. 405.

² Summer lodge, covered with cloth, Japanese matting and Indian matting July, 1903; East of Ellensburg. Museum negatives no. 44523, 8-1 from the southeast; no. 44524, 8-2, from the west; and no. 44525, 8-3 a nearer view; and summer lodge covered with cloth, July 1903, in the northern part of Ellensburg, Museum negative no. 44526, 8-4 from the east.

³ Spinden, Fig. 6, Plate x.

⁴ Lewis and Clark, V, p. 16.

⁵ Gibbs, (a), I, p. 407.

⁶ Museum negative no. 44530, 8-8 from the southwest

of south in Fig. 1, Plate v.¹ This was probably kitchen refuse. The little pits, each encircled with a slight embankment made up of the soil thrown out in making it, p. 15, are probably the remains of food caches near the houses.

TOOLS USED BY MEN.

A number of objects which seem to be tools intended to be used by men are found in this region. Among these may be mentioned a wedge, hammer-stones, a celt, a hand-adze, drills, scrapers, and an arrow-shaft smoother.

Wedges. Wedges made of antler were not frequently found by us as in the Thompson River region,² although according to Lewis, elk horn wedges or chisels were used for splitting wood in the general plateau region of which this is a part.³ One specimen, however (202-8378b), was found on the surface near the head of Priest Rapids, which is apparently a longitudinal fragment of a wedge broken off at the top and cut by longitudinal grooving along one edge, the other edge being a portion of the surface of the wedge formed by cutting convexly across the antler. The specimen is bleached from exposure on the surface. Another wedge, shown in Fig. 39, was found on the surface near the Columbia River below the mouth of the Snake. It is made of antler which has since been bleached from exposure on the surface of the ground.

Fig. 39 (20.0-1464).
Wedge made of Antler. From the surface near the Columbia River below the Mouth of the Snake. $\frac{1}{4}$ nat. size. (Collected and presented by Mr. Owen.)

The top was partly cut off and then broken across, while one side edge shows where the antler was grooved lengthwise for over half its length, from the inner surface and then broken out. This shows that the process of cutting up pieces of antler in this region was similar to that employed in cutting both antler and nephrite, in the Thompson River region and on the coast of British Columbia and Washington. It has since been battered. One side shows the nearly flat outer surface of part of the antler, the other has been cut off to form the wedge, which is constricted towards the point so that it assumes a somewhat spatulate form. This specimen is twisted, until the

¹ Museum negative no. 44531, 8-9 from the west of south.

² Smith, (d), p. 141; (c), p. 414.

³ Lewis, p. 186.

point is in a plane about 45° from the poll. It was collected by Mr. Owen who believes it to have been used as a spatula for grinding paint upon the surface of a rock. Wedges made of elk antler are common in the Nez Perce region where they are said to have almost completely supplanted celts.¹

Although no wedges were found by us in the Yakima Valley proper, and we can mention only these two specimens in the whole Yakima region yet it seems probable that they were here used and for the same purposes as in the Thompson River region to the north, the Nez Perce area to the east and on the coast to the west for splitting timber, for cutting firewood and for general carpenter work. Perhaps their relative scarcity here, as compared with the Thompson and the Nez Perce country, may be explained by supposing that wooden wedges, such as are more common than antler wedges on the coast, and which may have decayed were here used more than those made of antler.

While the stone hammers or pestles with convex bases, which are described on p. 39 *et seq.* were probably largely used for crushing food and other material; yet some of them and those with concave bases, were undoubtedly sometimes used as hammers for driving wedges, setting stakes, pinning out skins and for similar purposes.

Hammerstones. The deeply pitted hammer, such as is found in the Mississippi Valley, was not seen here, and it will be remembered² that they were not found in the Thompson River region. Tough pebbles, however, were used for pounding. At the quarry shop mentioned on p. 16, we found a number of pebbles that were evidently used in breaking up the material out of which to make chipped implements. One of these (202-8129) is merely a water-worn pebble, 73 mm. long, an edge of which has been broken off, and a sharp corner shows signs of its having been used as a hammer, as it has been battered and shows where one large chip has come off. It will be remembered that in the vicinity of the shop where the specimen was found, pebbles were rarely if ever seen, although the surface of the ground was covered with weathered fragments of volcanic rock. Another specimen (202-8127) found at the same place, shown southeast of the quarry pit, in Fig. 1, Plate III, is 155 mm. long and of a rather irregular cross section. The ends are battered and fractured from use. Apparently it may have been held between the two hands and used in breaking off large pieces of material. A longer hammer pebble, bearing the same catalogue number, and found at the same place, shows on the top of the quarry dump to the left centre in Fig. 1, Plate III. It is about 270 mm. long. In cross section it tends to be

¹ Spinden, pp. 182 and 189, Fig. 57.

² Smith, (d), p. 142; (c), pp. 415 and 440, Fig. 38.

triangular with rounded corners. The ends are battered and long slivers have been broken off. The specimen shown in Fig. 40 is from the same place, shorter, but similar in that the section is sub-triangular and that each end is both battered and slivered. Other battered pebbles and fragments slivered from them were found at the same place. The hammerstone shown in Fig. 41 was found on the surface near the head of Priest Rapids. It is an oval pebble, nearly twice as wide as it is thick, of yellowish brown color, which has been used for a hammer, as is indicated by the battered and chipped condition of its ends.

Another specimen, shown in Fig. 42, is made of a hard, dark green or bluish, water-worn pebble. It was found in the Snake River Valley, twenty miles above the mouth of the river, and is in the collection of Mr. Owen. Both ends are battered and the margins of the battered surfaces are chipped. Mr. Owen says such objects were used in pecking pestles, mortars, and similar implements into shape. Fig. 43 illustrates one of these hammerstones, found on the surface at Kennewick. It is a part of a pebble

of tough dark blue material, apparently glassy basalt. One side edge and one end have been chipped and show large scars on each side of the side edge and several on one side of the top. Near the middle of one side, and opposite it on the other side edge, there are signs of pecking which suggest an attempt at grooving. The lower corner of the pebble shows signs of having been used as a hammer for pecking. A small spatulate pebble slightly curved (202-8215), found at the same place, is battered entirely around the edge of its larger end and in one place on the side of the narrow end. The battering has given it a smooth surface in places which suggests that it was used for pecking, rather than chipping. A large, rather flat, oval pebble (202-8213) from the same place has large chips off from both sides of its edge in three places, three fourths of its edge being so chipped. This seems more likely to be a hammerstone used for chipping.

Fig. 40 (202-8128). Hammerstone. From quarry on north side of Naches River about two miles above its mouth. $\frac{1}{2}$ nat. size.

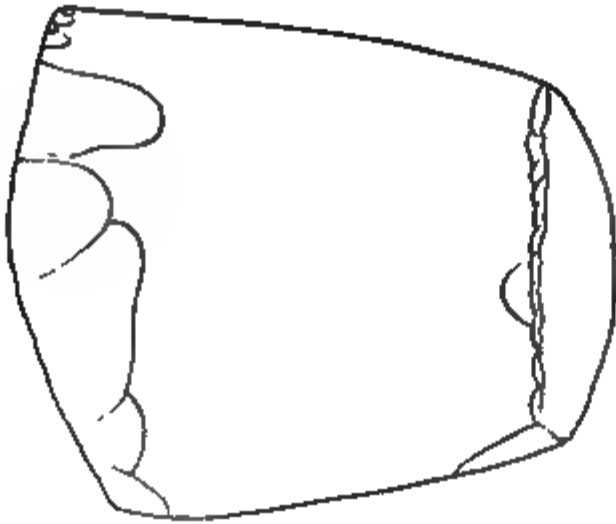


Fig. 41

Fig. 41 (202-8292a). Hammerstone. From the surface, near the head of Priest Rapids. $\frac{1}{4}$ nat. size.
Fig. 42. Hammerstone made of a Hard. Water worn Pebble. From Snake River Valley twenty miles above its mouth. $\frac{1}{4}$ nat. size.
(Drawn from a sketch. Original in the collection of Mr. Owen.)
Fig. 43 (202-8419) Hammerstone. From the surface, Kennewick. $\frac{1}{4}$ nat. size.

Fig. 42.

Fig. 43.

The long, narrow, oval pebble, shown in Fig. 44, is about 140 mm. long, of a yellow, volcanic, coarse-grained rock, and is in the collection of Mr. Austin Mires of Ellensburg. This was found at Priest Rapids. The top is battered and slightly chipped, the other end has been battered to a rather flat edge, and this battered surface extends one half way up one side of the specimen and two thirds of the way up the other.¹ A large flat oval pebble (202-8214), found on the Cherry Creek camp site, has a notch pecked in each side edge and is battered slightly on one end. It may have been notched for hafting as a hammer, or for use as a net sinker, but the battered end suggests the former use. These pebbles which have been used as hammerstones, remind us of the unbattered pebbles found with pieces of glassy basalt in certain caches near Kamloops.² Pebbles used as hammerstones are also found in the Nez Perce region to the east³ and according to Lewis stone hammers were used for splitting wood in the general plateau region of which this is a part.⁴

A pebble, oval in outline and in cross section (202-8303), found on the surface of the bank of the Columbia River, near the head of Priest Rapids, is battered on one side edge near the middle in a way that suggests that the place was for the reception of the end of a handle. The lower edge is battered and the top has a large chip off of each side. It was probably used as a hammerstone. Another flat oval pebble of lava (202-8305) found at the same place, is chipped on both sides of the entire edge; but the edge is not sharp, apparently having been dulled by scraping, the natural sand blast or weathering. A disk or sub-oblong-shaped pebble (202-8304) also found at the same place is chipped from one side only across the entire edge at a slight bevel so that it has a nearly flat edge. The high places of the edge are smoothed as if from its use in pecking, yet it does not seem to have been much used for such a purpose or to need to have been chipped into disk form for that use.

None of the pebbles which were notched and supposed to be net sinkers, as mentioned on p. 30 and that were found in this region, show battered ends or appear as if they had been used as hammers. On the other hand, some of the grooved pebbles described as net sinkers are battered, p. 30. It will be remembered⁵ that no notched hammers or those grooved entirely around, like those found here, were found in the Thompson River region, although a pebble which had been notched or grooved on two edges was

¹ Museum negative, no. 44534, 8-2

² Described by Smith, (c), p. 415.

³ Spinden, p. 188.

⁴ Lewis, p. 186; Lewis and Clark, III, p. 124.

⁵ Smith, (c), p. 415.

found and figured as a hammer.¹ Nor was the grooved stone maul used by the Nez Perce to the east according to Spinden² although many specimens are found on the Umatilla in northern Oregon to the south.³

Celts. Celts made of stone such as were common in the Thompson River region⁴ were not found by us in the Yakima region; but one typical specimen

Fig. 44.

Fig. 44. Hammerstone made of a Close-Grained Yellow Volcanic Pebble. From Priest Rapids. $\frac{1}{4}$ nat. size. (Drawn from photograph 44534, 8-2. Original in the collection of Mr. Mires.)

Fig. 45.

Fig. 45. Celt made of Serpentine. From an Indian at Ellensburg. $\frac{1}{4}$ nat. size. (Drawn from photograph 44507, 6-8. Original in the collection of Mr. McCandless.)

which apparently resembles the celts found on Puget Sound, more than it does those found in the Thompson River region is shown in Fig. 45. It may be seen in the collection of Mr. McCandless who secured it from an Indian

¹ *Ibid.* Fig. 347.

² Spinden, p. 188.

³ Lewis, p. 186; Lewis and Clark, III. p. 124.

⁴ Smith, (d), p. 142; (c), p. 415.

at Ellensburg. This celt is made of serpentine and is 190 mm. long.¹ A similar specimen, in the same collection, resembles this one but shows grooves along the side edges by means of which it was cut out. There is a celt made of green serpentine, only about 3 mm. thick in the collection of Mr. Owen, but it was found at Umatilla, Oregon.

Celts of jadeite (?) narrow and oblong were found on Snake River above Lewiston in the Nez Perce region to the east.² Spinden states that these were evidently acquired by trade from natives of the northwest coast and that they have been cut by grooving and breaking. Also, that this method and material was not employed by the Nez Perce who considered the objects to have been used as wedges. I am inclined to believe, therefore, that these more nearly resemble the celts of the Thompson River country³ than they do those of the coast. At least one celt of this general style has been found near Lake Chelan lying between the Thompson River region and both the Yakima and Nez Perce regions. It is a long stone celt and was found in an ancient grave on the bank of the Chelan River near the house of Hon. Amos Edmunds, of Chelan, Washington. In the graves of this group, according to Mr. C. G. Ridout, who cooperated with Mr. Edmunds in excavating at this place, and from whom all of our information on this specimen was obtained, stone knives and skinning and scraping tools were found. This celt is of a mottled green "marble resembling onyx" (probably serpentine or nephrite) 400 mm. long, 47 mm. wide and 15 mm. thick. It is slightly concave on the two sides, while one side edge is flat and the other is concavely bevelled. The poll is of the natural unworked stone and judging from the drawing furnished by Mr. Ridout, was broken off. It is raggedly diagonal. The cutting edge is sharpened by long convexly ground surfaces of nearly equal size and curve. The bevel of the side edge suggests that the material for the celt was cut out by grooving and breaking as was the case in the Thompson River region, where the celts showed similar traces of grooving.⁴ It is true that similar grooving may be seen on celts from the Coast, but in that region the celts are short, while in the Thompson River area they are long like this one and the material is more often of the mottled green color than on the coast. The specimen is owned by Mr. Edmunds and is in the collection of Mr. Ridout.

No pieces of antler or other material which may possibly have served as celt hafts were found in this region, although it will be remembered that one specimen, thought possibly to have been such, was found at Kamloops in the

¹ Museum negative no. 44507, 6-8.

² Spinden, p. 182 and Figs. 1, 2, Plate ix.

³ Smith, (c), Fig. 349.

⁴ Cf. Smith, (c), Fig. 349.

Thompson River¹ region, another in the Lillooet Valley² and that celt hafts made of antler were common on the coast at Port Hammond,³ Comox,⁴ Saanich,⁵ and Utsalady.⁶ A piece of antler (202-8378a), found on the surface near the head of Priest Rapids, is much bleached and shows signs of having been daubed with red paint. It consists of a piece which has been cut around below a fork with some sharp instrument and then broken off. The prongs seem to be simply broken off.

Hand-Adze. Only one hand-adze has been found in this area, so far as I am aware. It is catalogue No. 25 in the collection of Mr. Janeck, made of stone and found near the surface of an old burial ground of the Indians near the mouth of the Yakima River on what is known as McNeals Island. This specimen is shown in Fig. 46, and is 165 mm. long, 228 mm. in greatest circumference which is around the part corresponding to the edge of the striking head of a pestle, 37 mm. in diameter at the top and 37 mm. along the edge of the blade. It is made of rock resembling diorite or diabase. The natural surface of the pebble from which it was made shows on the ridge of the striking head of the pestle-like part. The convex side of the celt-like part of the object is very smooth. This is apparently partly due to the fact that it presents the smooth natural surface of the pebble from which the object was made, and also to more or less friction which must have been received here when in use. It probably served as an adze. This specimen is perhaps the most ideal form of this type that I have seen, the upper end comparing closely to a pestle, with a slight indication of a knob at the top, a flaring body, and a short striking head, the sides of which extend as a ridge nearly if not entirely around the specimen. The celt-like part

Fig 46. Hand-Adze made of Stone. From the surface in an old burial ground of the Indians near the mouth of the Yakima River on McNeals Island. $\frac{1}{2}$ nat size. (Drawn from photographs 44503, 6-4, 44452 2-1. Original catalogue No. 25 in the collection of Mr. Janeck.)

is to one side of the axis, so that one side expands to meet the ridge above

¹ Smith, (c), Fig. 348, p. 415.

² Teh, (b) Fig. 66.

³ Smith, (a), Figs. 29 and 59.

⁴ Smith, (b), Fig. 107.

⁵ *Ibid.*, Figs. 129-130.

⁶ *Ibid.*, Fig. 157.

mentioned, forming a concavity; the other contracts to meet it forming a convex sweep from the cutting edge to the beginning of the body of the pestle-like part.¹ Such hand-adzes have been found at Portland, Columbia Slough about ten miles below Portland,² and Mr. E. D. Zimmerman of Philadelphia has informed me that there are five or six specimens of this type in his collection but the discovery of this specimen at McNeals Island marks the most eastern occurrence of this type, so far as I know at present.³

Whetstones. Whetstones, recognized as such, are rare in the Yakima region but a fragment (202-8217) of a sandstone pebble, which is apparently rubbed on the irregular sides was found on the surface of the little camp site, west of Cherry Creek, near Ellensburg. It probably served as a rough whetstone or for grinding implements into shape.

The cigar-shaped object made of friable stone, shown in Fig. 69, and considered on p. 81 as a war implement or "slave-killer," is suitable for use as a whetstone and may have been such. The object thought to be a whetstone shown in Fig. 120, is in the collection of Mr. Janeck, and is said to be from the Yakima Valley. It is made of friable slate; the top is broken off. It is 142 mm. long, 18 mm. wide and 6 mm. thick with rounded edges. The circle and dot design incised on the specimen is described on p. 131. It would seem that use as a whetstone would destroy the design.³ From the whole region, I have seen only these three specimens that can be considered as whetstones. This scarcity seems somewhat remarkable when we consider their abundance in the Thompson River region,⁴ and also on the coast at Port Hammond and Eburne in the Fraser Delta,⁵ Comox,⁶ North Saanich⁷ Victoria,⁸ New Dungeness,⁹ and Port Williams.¹⁰

Beaver teeth sharpened for use as knives, such as were found in the Thompson River region,¹¹ were not found by us in this whole area any more than in the Fraser Delta,¹² although they were present at Comox,¹³ and though not certainly identified at both Saanich¹⁴ and Burton.¹⁵ However,

¹ Museum negatives nos. 44452, 2-1 and 44503, 6-4.

² First mentioned on pp. 303-304, *Noteworthy Archaeological Specimens from Lower Columbia Valley*, by Harlan I. Smith, *American Anthropologist*, (N. S.) Vol. VIII, No. 2, April-June, 1906.

³ Museum negative no. 44503, 6-4.

⁴ Smith, (d), p. 144; (c), p. 417.

⁵ Smith (a), p. 167.

⁶ Smith (b), p. 312.

⁷ *Ibid.*, p. 339.

⁸ *Ibid.*, p. 360.

⁹ *Ibid.*, p. 389.

¹⁰ *Ibid.*, p. 392.

¹¹ Smith (d), p. 144; (c), p. 417.

¹² Smith (a), p. 168.

¹³ Smith (b), p. 318.

¹⁴ *Ibid.*, p. 346.

¹⁵ *Ibid.*, p. 398.

a beaver tooth was found (202-8189) in cremation rectangle No. 21 (16) on the flat overlooking the mouth of the Naches River. Objects that are considered as knife handles, such as were found at Lytton,¹ though not certainly at Kamloops² were absent here as in the Fraser Delta.³ Objects made of bone or antler and thought to have been used for flaking stone implements were also absent.

Drills. Drill points chipped from stone are perhaps less abundant in the Yakima country than in the Thompson River region⁴ to the north. They are found of various shapes in the Nez Perce region⁵ to the east but it will be remembered that they were not certainly identified among finds from the coast.⁶ The specimen shown in Fig. 47, was collected at the head of



Fig. 47.



Fig. 48.

Fig. 47 (202-8398). Point for a Drill, chipped from Chalcedony. From the head of Priest Rapids. $\frac{1}{2}$ nat. size. (Collected by Mrs. J. B. Davidson.)

Fig. 48 (202-8370). Point for a Drill, chipped from Chert. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Priest Rapids, and presented by Mrs. J. B. Davidson of Ellensburg. It is chipped from a grayish chalcedony. The shaft is rather blunt at the end, possibly having been broken off, and is somewhat lozenge-shaped in cross section although one side has a less pronounced ridge than the other which causes the section to tend towards the sub-triangular. The base expands sidewise and is somewhat thinner at the end than at the shaft although it is thicker than the point. A point somewhat similar in shape, but 57 mm. long, chipped from white chalcedony, and found at Priest Rapids, was seen in the

¹ Smith (d), Fig. 50.

² Smith (c), p. 418.

³ Smith (a), p. 168.

⁴ Smith (d), p. 148; (c), p. 419.

⁵ Spinden, p. 185, Figs. 23-25, Plate VII.

⁶ Smith (a), p. 190; (b), p. 438.

collection of Mr. Austin Mires. Another drill point chipped from black trap, 48 mm. long, and also found at Priest Rapids, was seen in the same collection. The shaft expands sidewise into a base of the form of a truncated triangle which is rather thin. Fig. 48 shows a drill point chipped from reddish brown chert that was found on the surface near the head of Priest Rapids. The upper portion resembles the first-mentioned specimen and the lower part is somewhat similar to it but more lenticular in cross section. In other words, the implement is either double-pointed or it was intended to chip away the lower part. The lower point is so well chipped to form that it seems more likely to be a double-pointed drill.

Holes which have been drilled and apparently with such drills as these are seen in the stone objects shown in Figs. 34, 77, 81, 99, 105, 119. The shell object shown in Fig. 88 probably was broken; but in Figs. 76, 79, 90, 91, 93 and 94, the shell seems drilled and in Fig. 73 the antler is drilled.

Scrapers. For scraping and shaving, the objects shown in Figs. 49-52 would have been useful. One side of these consists of a large facet, as in the case of Fig. 50, or is but slightly chipped. This surface on the first two specimens shows the bulb of percussion, while on the fourth all signs of the bulb have apparently been obliterated by secondary chipping along a longitudinal third, probably done to flatten the side, although as this scraper was made from a fragment of a flake rather than from the whole flake it is possible that the bulb was not on this piece. In the third specimen the bulb does not show as the object was not made from a flake but from a thin piece of chalcedony which shows striations upon both surfaces suggesting that it may have been the filling or cast of a seam from which it has separated. The upper ends of the first two specimens are somewhat convex on this surface probably because of the bulb of percussion. The lower or wider ends, which are chipped to a scraping edge from the opposite side on all the specimens are somewhat concave or at least flat as in the third specimen. The other two are not so regular in outline, but are also chipped like a scraper at the broad end and the side edges. The specimen shown in Fig. 52 was found on the surface of the little camp site on Cherry Creek, near Ellensburg, and is of a waxy, yellowish brown chalcedony. It is shaped something like a gun flint.

There is a scraper 66 mm. long made of a greenish slate in the collection of Mrs. Davidson to whom it was presented by Mr. Owen. It is somewhat tongue-shaped and slightly concavo-convex. The base is broken while the curved edge is slightly chipped on the convex side to form an edge. The point is rather thin and has been somewhat rubbed. Red paint has been daubed on the specimen which suggests that it may have been found in a grave. It will be remembered that scrapers were found, although not so

frequently, in the Thompson River region ¹ to the north and that in the Nez Perce region to the east,² they are usually irregular in form, flat on one side and convex on the other. While their chief use may have been for skin scraping, they are found by experiment to be excellent implements for planing wood, and may well have served for the scraping down of arrow-shafts, spear-shafts, and for similar work.

Some of the chipped points described on p. 23 may have been used for knife points. Among these there are a number of specimens which were particularly suited for this use. The specimen shown in Fig. 6 may have served as a knife, possibly one used for ceremonial purposes although it may have been used as a spear point. These knives, being somewhat symmetrical



Fig. 49.

Fig. 50.

Fig. 51.

Fig. 52.

Fig. 49 (202-8371). Scraper chipped from Petrified Wood. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 50 (202-8372). Scraper chipped from Agate. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 51 (202-8373). Scraper chipped from Chalcedony. From the surface, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 52 (202-8221). Scraper chipped from Chalcedony. From the surface of the Cherry Creek Camp Site near Ellensburg. $\frac{1}{2}$ nat. size.

differ from the one found at Kamloops³ in the Thompson River region which was similar in shape to the knives used until recently by the Thompson River Indians.⁴ These knives from the Thompson River region are chipped much more from one side than from the other and have curved points. The specimen shown in Fig. 3 (202-8336) has an absolutely flat base which is apparently an unworked portion of the block from which the object was

¹ Smith (c), p. 418.

² Spinden, p. 185 and Fig. 54.

³ Smith (c), p. 418, Fig. 352d.

⁴ Telt, (a), Figs. 125-126.

chipped. It is possibly an unfinished arrow point, but its outline suggests that it is a knife point. The specimen shown in Fig. 2 is chipped from waxy red chalcedony. It has a straight end and one edge of the point is slightly more curved than the other, which together with the fact that one side is nearly flat suggests that it may have been one of those points which are considered to have been used for knives rather than for arrow or spear points. The specimen (202-8369) shown in Fig. 1 may have served either as the tip for an arrow or as a knife point, and it may be compared with the much more deeply serrated points found in the Thompson River region.¹

Arrow-shaft Smoothers. Arrow-shaft smoothers, made of coarse sandstone like those from the Thompson River region,² were not found by us in this area nor on the coast;³ but one of these grooved stones was seen in the collection of Mr. E. R. McDonald at Ellensburg. It was collected by Mr. Dick Williams, of the same place, who found it on the west bank of the Columbia River, twenty miles north of Priest Rapids, Kittitas County. It is made of a salmon-colored gritstone, and is of the usual type, semi-cylindrical with a longitudinal groove on the flat side, in this case a very small groove such as might occur if it had not been much used. In the Nez Perce region to the east,⁴ according to Spinden, there have been found an arrow-shaft smoother made up of two somewhat rectangular blocks of light tufa, each with a semi-cylindrical groove in one side and a soapstone object which he considers to be an arrow-shaft polisher, but I have considered this as a mat presser.

TOOLS USED BY WOMEN.

A number of implements were found which may have served for the preparation of skins and for sewing. Among these may be mentioned skin scrapers, awls, a needle, and a mat presser.

Scrapers Chipped from Stone. The scrapers chipped from stone, shown in Figs. 49 to 52, and considered among tools used by men on pp. 67-68, may possibly have been used on skins although they seem rather small for such a purpose. The specimen shown in Fig. 53, made from a flat circular pebble was found on the surface of the bank of the Columbia River, near the head of Priest Rapids. The edges are chipped in such a way that it has been brought somewhat to the form of a square. This object would serve

¹ Smith (d), Figs. 8 to 19; (c), Figs. 332 i-j and 334.

² Smith (d), p. 145; (c), p. 419.

³ Smith (a), p. 190; (b), p. 438.

⁴ Spinden, p. 187, Fig. 32, Plate VII.

well as a skin scraper if hafted in the split end of a stick and used like similar implements seen in use by us among the natives of the Thompson River region.¹ It resembles archaeological specimens from the same area.² In the Nez Perce region to the east³ a disk-shaped spall struck from a boulder was used for skin scraping. Another form, shown in Fig. 54, is chipped from a pebble, probably a flat circular one. Along one side, the surface of the pebble shows, but on the other it has been completely chipped away. In outline, the object is elliptical, but has a slight tendency to be pointed at each end. It is lenticular in section, with the edges jaggedly sharp. This reminds us of certain specimens found at Columbus and The Dalles, which have the same general shape, but are ground and polished, so that no signs of chipping remain on some of them. It seems probable that this specimen

Fig. 53.

Fig. 54.

Fig. 53 (202-8302). Scraper chipped from a Flat Circular Pebble. From the surface of the bank of Columbia River near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

Fig. 54 (202-8307). Scraper or Knife chipped from a Pebble. From the surface of the bank of Columbia River, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

is a roughed-out form of the same kind, which may have been used in its present condition, or was intended to be finished by grinding and polishing. It seems quite likely that this implement may have been hafted in the end of a split stick and used as a skin scraper, similar to those previously mentioned. On the other hand, it may have been held in the hand and used in scraping skins or perhaps as a knife. It was found with another on the surface of the bank of the Columbia River, near the head of Priest Rapids. Another of these (202-8117) was found on the surface at Kennewick. The specimen shown in Fig. 55 is simply an oval water-worn pebble with one edge chipped on both sides. It is 115 mm. long by 16 mm. thick, may be an unfinished

¹ Text (a), Fig. 1, Plate XIV, and Fig. 127.

² Smith (d), Fig. 64, (c), Fig. 355.

³ Spinden, p. 215.

object, if not a scraper or knife, and was found on the surface of the bank of the Columbia River near the head of Priest Rapids.

Scrapers Rubbed from Bone. Scrapers made of bone, similar to those found by us in the Thompson River region and in the vicinity of Puget Sound¹ were not seen in the Yakima region.

Awls Rubbed from Bone. Awls made of bone have been found in this area. The specimens made of stone, mentioned on p. 25 among chipped points, and on p. 66 among drills may have been used by women for the same purposes. The specimen shown in Fig. 56, was found on the surface of an island in the Columbia River near the mouth of the Snake, and it is bleached from exposure. It was collected and presented by Mr. D. W. Owen. The specimen shown in Fig. 57, was found on an island in the Columbia River, forty miles above the mouth of the Snake, and it is bleached from exposure on the surface. The shaft is nearly circular in cross section

Fig. 55 (202-8297). Scraper or Knife chipped from a Pebble. From the surface of the bank of Columbia River, near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

and tapers to a point for one half its length. The base ends in a flat elbow piece. The outline of the end of this projection is rounded. The specimen was collected and presented by Mr. D. W. Owen.

No awls made from the proximal part of the ulna of the deer were seen by us in this area, although it will be remembered they were found in the Thompson River region² and are reported from the Nez Perce region to the east by Spinden who says that they were used in braiding rope.³ We found them on the coast of British Columbia and Washington.⁴ The same remarks are true of awls made of the distal end of the metapodial of the deer.⁵

¹ Smith (d), Figs. 65 and 66; (c), Fig. 356; (a), Fig. 34; Telt (a), Figs. 128 and 129.

² Smith (c), Fig. 357.

³ Spinden, p. 189, Plate VII, Fig. 29.

⁴ Smith (a), p. 170 (*Eburne and Hammond*); (b), p. 317, (*Comox*); p. 347 (*Saanich*); p. 377, (*Stanwood*); p. 389, (*New Dungeness*).

⁵ Smith (d), Fig. 74; (c), Fig. 357; (a), Fig. 35, (*Eburne*); (b), p. 317, (*Comox*); p. 348, (*Saanich*).



Fig. 56.



Fig. 57.

Fig. 56 (20.0-1466). Awl made of Bone. From the surface of an Island in Columbia River near the mouth of the Snake. $\frac{1}{2}$ nat. size. (Collected and presented by Mr. Owen.)

Fig. 57 (20.0-1465). Awl made of Bone. From an Island in Columbia River, forty miles above the mouth of the Snake. $\frac{1}{2}$ nat. size. (Collected and presented by Mr. Owen.)

This seems rather interesting since these two kinds of awls, each made of a special bone are so commonly found and so widely distributed in America that it seems hardly possible that they may not yet be found in this region. Simple sharpened bone implements which are said to have been used as awls are found in the Nez Perce region¹ where according to Spinden, a small awl was used in making basketry but we saw none in the Yakima region not considered to be points for arrows or spears.

Needles. Only one object which may be considered as a needle was seen by us in the Yakima region, and it will be remembered that they are rare on the coast of British Columbia and Washington, except in the Lower



Fig. 58. Spatulate Object made of Bone. From the Yakima Valley. $\frac{1}{2}$ nat size. (Drawn from photograph 44503, 6-4. Original catalogue No. 13 in the collection of Mr. Janeck.)

¹ Spinden, p. 189, Plate VII, Figs. 27 and 28.

Fraser¹ country, although they were common in the Thompson River region.² This specimen shown in Fig. 58 is a long needle-like object, No. 13, in the collection of Mr. Janeck. The object is warped or bent like the needles used in the Puget Sound country to string cat-tail stalks together in order to make mats. This specimen is 291 mm. long. The point is sharpened and although the side edges are flat, it somewhat resembles a paper knife. At a point nearly one third of its length from the base, it is perforated through the middle by gouging from each side. The base is notched, in such a way that the object is bilaterally symmetrical as shown in the illustration. It may possibly but not probably have served as a sap scraper.³

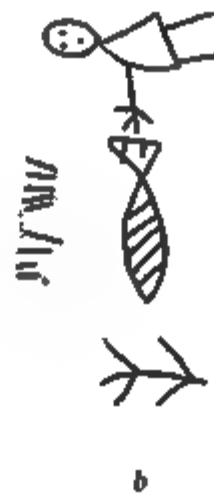


Fig. 59 *a* Object made of Steatite, probably a Mat Presser. From Prosser. $\frac{1}{2}$ nat. size. (Drawn from photograph 44504, 6-5. Original in the collection of Mr Spalding). *b*, Part of Incised Pictograph on Object Shown in *a*.

Mat Pressers. Mat pressers, or objects that are considered to be such, made of stone are commonly found in the area immediately to the south. No objects recognized as such were found by us in the Thompson River region, and from the coast of British Columbia and Washington there is only one. It is made of stone⁴ and was found at Cadboro Bay near Victoria. Specimens made of wood are very common among the present natives of the same coast. A ground soapstone object from the Nez Perce region is considered by Spinden an arrow-shaft polisher,⁵ but seems to me more likely to be a mat presser of the type found in the region immediately south of the Yakima area.

The object shown in Fig. 59 which may be an unfinished pipe, is of the

¹ Smith, (a), Fig. 36.

² Smith (d), Figs. 76-78, (c), Fig. 358.

³ Museum negative no. 44503 (6-4).

⁴ Smith (b), Fig. 146.

⁵ Spinden, Plate VII, Fig. 34.

form of a flattened cylinder, made of steatite and was found at Prosser in the southern part of the area here considered. The surface is marked with incised figures, part of which are illustrated in Fig. 59b and described on p. 124. The groove on one side suggests that it may have been used as a mat presser such as are used to string cat-tails and tule stalks. The cylindrical bore in the top is 25 mm. deep by 10 mm. in diameter and its top is funnel-shaped. The original is in the collection of Mr. Spalding.¹

PROCESSES OF MANUFACTURE.

The processes of manufacture employed in this area as indicated by the archaeological objects found include fracturing by chipping and flaking, pecking or bruising, grinding, polishing, cutting by grooving and breaking, incising, whittling and gouging, and drilling. The materials worked by each of these processes may be seen among the specimens here figured and described. Spinden states² that in the Nez Perce area chipped implements were made by the men and that the pecked artifacts were made by the women.

LIFE HISTORIES OF MANUFACTURED OBJECTS.

The story of the manufacture of the objects found from the securing of the raw material to their finished and to their worn out and broken condition is not shown completely in the case of more than one class of objects, viz., chipped implements, but in a number of cases the signs of manufacture have not been entirely obliterated and some specimens are figured and described which are undoubtedly in process of manufacture. Plate III, Fig. 1 shows a quarry from which material for the manufacture of chipped implements was obtained. A description of this has been given on p. 16. Here could be seen the hammers, one of which is illustrated in Fig. 40, that were used in breaking up the raw material, and the material in various stages of chipping and flaking together with the waste products. In Plates I and II may be seen the more or less completed chipped implements. If points of antler were used as flakers, they were either not found or recognized by us. According to Mr. Cotton, there are numerous chips within the "fort" mentioned on p. 82. One other example of a series illustrating the life history of an object may be mentioned, namely, that of the pestles. Many oblong peb-

¹ Museum negative no. 44504, 6-5.

² Spinden, p. 185.

bles suitable for pestles without being changed from their natural form were seen in both the Yakima and the Columbia Valleys. Other pebbles required but slight shaping to bring them to the required form. Fig. 22 illustrates such a pebble which is in process of shaping by pecking or bruising and Fig. 43 shows a suitable tool for executing the work. After being fully shaped by this process such pestles were polished but the materials used for this purpose, whether sandstones and similar abrasives, the horse tail rush or the bare hand, are not known.

WAR.

Implements used in Warfare. The objects considered under hunting on p. 23 *et seq.*, such as chipped points for spears, arrows and knives may have served in warfare; so also may bows, mentioned on p. 29. Others that were considered as tools, on p. 57 *et seq.*, such as the celt and hand-adze, may have been used as weapons in war times; but there are some objects that were probably useful only in warfare. Prominent among these are the club-heads and clubs, made of stone, shown in Figs. 60-68. No clubs made of copper, antler or whale's bone have been seen by us that are certainly from this region although it will be remembered ¹ that such were found in the Thompson River region, lying to the north, that the latter are common on the coast of British Columbia and Washington ² to the west of this area and that one of whale's bone labeled from the upper Columbia River has been figured in my report on the archaeology of Puget Sound.³

Grooved Pebbles, Club-heads, or Sinkers. The grooved spheroid pebble, shown in Fig. 60, was found on the Yakima Reservation near Union Gap and is in the collection of Mr. Janeck. There are two encircling grooves which cross each other at nearly right angles. These have been made by pecking. At one intersection of the grooves, the object shows signs of battering such as may have resulted from pounding with it, or such as may have been made to form a pit for the reception of a handle end. It is probably a club-head, net sinker or gaming stone ⁴ similar to those used in the Thompson River region.⁵ In the Nez Perce region ⁶ to the east unworked river boulders sewed in skin, were used for the heads of war clubs which were sometimes also used in killing game. This kind of club is the same

¹ Smith (d), Figs. 81 and 82; (c), Fig. 359.

² Smith, (b), Figs. 165-171.

³ Smith (b), Fig. 166d.

⁴ Smith (d), Fig. 39; (c), p. 440; Teit (a), p. 279.

⁵ Museum negative no. 44455, 2-4.

⁶ Spinden, pp. 188 and 227, also Fig. 5^b.

used by the eastern Indians, according to Lewis¹ and was probably introduced. The spheroid specimen made of hard lava, possibly trap, shown in Fig. 61, was found on the Yakima Reservation near Union Gap, and is also in the collection of Mr. Janeck. There are three grooves, marking great circles at right angles to each other. These have been made by pecking. At each pole or the intersection of two of these grooves, at the top and bottom in the illustration, and in each area marked out by the grooves is a pit making a total of ten. In the equatorial grooves are the remains of two parallel strings, each twisted to the right or contra-screw-wise, made up of two strings twisted to the left and remains of a fabric of loose mesh overlying the strings. It measures 70 mm. by 63 mm. by 57 mm.² A club-head made of stone

Fig. 60.

Fig. 61.

Fig. 60. Grooved Pebble. From the Yakima Reservation near the Gap. $\frac{1}{2}$ nat. size. (Drawn from photograph 44455, 2-4. Original in the collection of Mr. Janeck.)

Fig. 61. Club-head or Sinker made of Lava. From the Yakima Reservation near the Gap. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original in the collection of Mr. Janeck.)

with a handle covered with rawhide and horsehair, was seen by us in the collection of Mr. Janeck. The head is grooved, circular in cross section, and has conoid ends. It consequently resembles the stone clubs of the eastern Plains. The objects shown in Figs. 14-16 and considered as sinkers, may have been fastened to handles and used as heads for war clubs or as 'canoe smashers' in warfare.

Stone Clubs. The club³ shown in Fig. 62, is made of serpentine. The handle is oval but approaches a lenticular form in cross section. There are eighteen notches across one edge of the knob and eight on the other. The blade is of the characteristic form with lenticular cross section but thicker than the thin type of stone clubs of this form such as are found near the

¹ Lewis, p. 189.

² Museum negative no. 44455, 2-4.

³ First mentioned on p. 414 and Fig. 174a, Smith (b).

coast.¹ The tip is rather blunt. The reverse is the same as the obverse. It is from Methow River, Okanogan County and here illustrated from a sketch by Mr. Charles C. Willoughby of the original in the Peabody Museum, Harvard University.

The club shown in Fig. 63 was found in the Yakima Valley on the west side of the river between Wenas Station and Upper Gap above North

Fig. 62.

Fig. 62. Club made of Serpentine. From Methow River, Okanogan County. $\frac{1}{2}$ nat. size. (Drawn from sketches by Mr. Charles C. Willoughby. Original catalogue No. 64795 in the Peabody Museum, Cambridge, Mass.)

Fig. 63.

Fig. 63. Club made of Serpentine. From the Yakima Valley, between Wenas Station and the Gap above North Yakima. $\frac{1}{2}$ nat. size. (Drawn from photographs 44453, 2-2, and 44500, 6-1. Original catalogue No. 44 in the collection of Mr. Janeck.)

Yakima. It is made of serpentine of a mottled yellow, brown and green color. It is 26 mm. long, and of the form of a rather thick, elongated apple

¹ Smith (b), Fig. 172a, b.

seed, with the upper and lower ends cut off. The top is of the form of a symmetrical celt with a dull edge and is bevelled about equally from each side. The handle, which is 22 mm. thick, is the thickest part of the object, rather oval in section and merges into the blade, which is paddle-shaped, lenticular in cross section and terminates in a celt-like end which is dull and bevelled about equally from each side.¹ It is catalogue No. 44 in the collection of Mr. Janeck.² A club of this general type has been found as far east as Sand Point, Idaho, the most eastern occurrence, as was mentioned on p. 413 of my "Archaeology of the Gulf of Georgia and Puget Sound," where all the clubs of this type from Northwestern America are discussed. On the west, they seem to range from the Klamath Valley to the head of Puget Sound.

The club, shown in Fig. 64³ is made of stone and has a blade rather lenticular in cross section, but bulging somewhat so that it reminds us of the clubs of the lozenge-shaped cross section.⁴ It is 265 mm. long, by 25 mm. thick. The handle is somewhat lenticular, but tends to be hexagonal in section, with rounded corners and meets the blade abruptly. There is a saddle-shaped knob at the top with an incised geometric design in the hollow. The upper part of the right edge of this knob is flat with two incisions across it, while the lower part is rounded. A stone club with similar handle is known from Puget Sound.⁵ The specimen is catalogue No. 40 in the collection of Mr. Janeck, and was secured by him from the York collection. It was originally collected from an Indian woman on the Yakima Reservation.⁶

The club shown in Fig. 65 is made of diabase or allied material and is 338 mm. in length. It is bilaterally symmetrical and the reverse and obverse are alike. The handle is oval in cross section and terminates in a knob from which it is separated by a slight groove. In the top of the knob is a depression as if there had been a hole pecked through the form, tapering from each side, as in the clubs or slave-killers having lozenge-shaped cross section from the coast there⁷ the top broken off and the broken edges rounded, as in the club with lozenge-shaped cross section from Copalis on the coast of Washington.⁸ But such is not the case; the notch resembles that of the club shown in Fig. 64, slightly the one shown in Fig. 62, both from this

¹ Smith (b), p. 417.

² Museum negatives nos. 44453, 2-2, and 44500, 6-1.

³ First shown in Smith (b), Fig. 177a.

⁴ Smith (b), p. 415.

⁵ Smith (b), Fig. 177b.

⁶ Museum negatives, nos. 44453, 2-2 and 44500, 6-1.

⁷ Smith (b), Figs. 175 and 176.

Ibid., Fig. 175e.

region, and one from Burton on Puget Sound.¹ The blade is paddle-shaped like the large end of an apple seed, lenticular in cross section, with a mid-rib on each side which runs out about 10 mm. from the end of the club.² It was found on the surface at Union Gap, below Old Yakima, and is in the collection of Mr. Janeck.³

Fig. 64

Fig. 65

Fig. 66

Fig. 64. Club made of Stone. From Yakima Reservation. $\frac{1}{2}$ nat. size. (Drawn from photographs 44500, 6-1, and 44453, 2-2. Original in the collection of Mr. Janeck.)

Fig. 65. Club made of Stone. From the surface at Union Gap below Old Yakima. $\frac{1}{2}$ nat. size. (Drawn from photographs 44453, 2-2, and 44501, 6-2. Original in the collection of Mr. Janeck.)

Fig. 66. Club made of Stone. From the surface at Union Gap below Old Yakima. $\frac{1}{2}$ nat. size. (Drawn from photographs 44453, 2-2, and 44501, 6-2. Original in the collection of Mr. Janeck.)

The stone club, shown in Fig. 66, was found on the surface at Union Gap, below Old Yakima. It is of a purplish gray lava-like material. The handle is oval in cross section with a knob at the end which is somewhat flattened on each side and slopes towards the rounded top like a blunt

¹ *Ibid*, Fig. 177b.

² First mentioned, Smith, (b), p. 416 and Fig. 177c.

³ Museum negatives, nos. 44453, 2-2, and 44501, 6-2.

symmetrical celt. The blade has convex side edges which are nearly flat and about 18 mm. wide. It is thicker in the middle than at the edges and bears a mid-rib of the shape of a railroad embankment with rounded angles, from the handle to the end. On each side of this mid-rib, the surface is nearly flat. The end of the blade is nearly flat. The specimen is in the collection of Mr. Janeck.¹

It will be noted that the thin stone clubs found here have no mid-rib. Clubs made of stone, whale's bone or wood with such mid-ribs are unknown from the coast but are found with median decoration in place of a mid-rib,² those of whale's bone being common and a thin club made of copper with a median decoration was found at Spuzzum in the interior of Southern British Columbia.³

'*Slave-killers.*' A 'slave-killer' or club, made of friable stone shown in Fig. 67, was found on the surface of Union Gap, below Old Yakima. It is in the collection of Mr. Janeck. The object has a blade which sets out from the handle and resembles in shape the typical 'slave-killer' in that it is lozenge-shaped in cross section with bulging sides and rounded angles. The handle is oval or nearly circular in cross section, and slightly larger at the top where there is no knob or perforation as in the typical club of this type.⁴ The object is 377 mm. long, 63 mm. wide, and 41 mm. thick.⁵ The club or 'slave-killer' made of stone, shown in Fig. 68, was found at Lake Chelan, and is 280 mm. long. It is owned by Mr. C. G. Ridout of Chelan, Chelan County. The handle terminates in a knob, which resembles the form of an animal head. This knob is somewhat heart-shaped, the two lobes possibly representing ears, and the lower tip projects beyond the handle of the object. One side, the larger surface, stands at about 45 degrees to the axis of the club and is bisected by a deep incision, on each side of which are two circles, which probably represent eyes. On either edge of this knob are thirteen incisions. The handle which is nearly circular in cross section, bears four vertical rows of horizontally arranged incisions and expands suddenly edgewise to form the blade which, however, on its upper and lower surfaces is practically continuous with the handle. The blade is nearly circular in cross section and tapers gradually to a rather blunt point. The object is probably a ceremonial implement.

The stone objects considered as pestles and shown in Figs. 32 and 35 may have been used as war clubs. The object made of friable stone,

¹ Museum negatives nos. 44453, 2-2, and 44501, 6-2. First mentioned on p. 416 and figured in Smith, (b), Fig. 177d.

² Smith (b), Figs. 173a, b; 169a; 165a, c-g; 166a, b, d-g; 167a-d; 168a, c, d; 169f and 170a.

³ *Ibid.*, Fig. 172d.

⁴ *Ibid.*, Figs. 175, 176 and 177e.

⁵ First mentioned *ibid.*, p. 418. Museum negatives nos. 44453, 2-2 and 44500, 6-1.

shown in Fig. 69 was mentioned on p. 39 as possibly having been used as a pestle and again on p. 65 as being suitable for use as a whetstone. It seems most likely, however, that it served as an implement of war or as a 'slave-killer.' It is roughly of the shape of a cigar. The upper end is



Fig. 67.

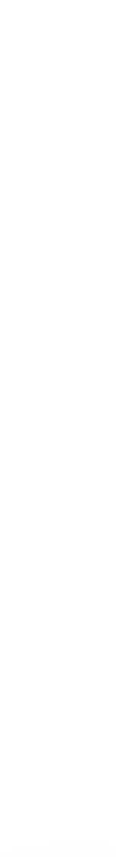


Fig. 68.



Fig. 69.

Fig. 67. Club made of Stone. From the surface at Union Gap below Old Yakima. $\frac{1}{2}$ nat. size. (Drawn from photographs 44453, 2-2, and 44500, 6-1. Original in the collection of Mr. Janeck.)

Fig. 68. Club made of Stone. From Lake Chelan. $\frac{1}{2}$ nat. size. (Drawn from a sketch furnished by Mr. C. G. Ridout. Original in his collection.)

Fig. 69. War implement or Slave Killer, made of Friable Stone. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original in the collection of Mr. Janeck.)

nearly flat and circular. From here the object gradually expands for about half its length and then contracts to a point, being nearly circular in cross section throughout. It is 208 mm. long, 38 mm. in maximum diameter, and 19 mm. in diameter at the top. It was found in the Yakima Valley and is in the collection of Mr. Janeck.¹ The object considered as a hand-adze and shown in Fig. 46, may have been used as a 'slave-killer.'

¹ Museum negative no. 44503, 6-4.

No objects considered as daggers or knives and made of antler were found by us in this region. Although it will be remembered ¹ that several, over 200 mm. in length, were found in the Thompson River region.

War Costume. The costume indicated on the figure carved in antler, described under the section of dress and adornment, p. 100, referred to in the discussion of art on p. 127, and shown in Fig. 121, may be that of a warrior as is suggested by the similarity of the headdress to the war-bonnet of the tribes of the Plains. That the war-bonnet was used in this region is strongly suggested not only by this headdress but also by those represented in the pictographs and petroglyphs as well as by the wearing of it by the modern Indians of this area. This idea is further strengthened by the fact that the war-bonnet is worn in the Nez Perce region to the east,² where it has no doubt been used for a long time, although it may originally have been derived from the Plains. The Nez Perce sometimes wore streamers with these war-bonnets. Spinden states that the early Nez Perce war-bonnets differed from the type used by them to-day, and that exact information about them is difficult to obtain.

Fortifications. A so-called "Indian fort" is situated near Rock Creek about six miles below Rock Lake. It is about a mile south of the ranch of Mr. Frank Turner (p. 54), and shown in the photographs reproduced in Figs. 1³ and 2⁴, Plate VI. These were taken and presented by Mr. J. S. Cotton, then in charge of the cooperative range work at the Washington State Experiment Station at Pullman, who furnished from his notebook all our data on this subject. The "fort" is built on a flat knoll of about fifteen feet in height and with precipitous sides. It is in the form of a circle, being enclosed about four fifths of the way around. The wall is built of flat rocks which are tilted in such a manner that they will glance all projectiles into the air. There were numerous arrow chippings within the "fort." There are many Indian graves supposed to be very old, two pits believed to mark building sites, and a long line of stones in the vicinity (pp. 140, 54, 29).

Wounds. The skull of skeleton No. 99-4318, found in rock-slide grave No. 10 (5) on the north side of the Naches River half a mile above its mouth, showed where the right side of the orbit had been pierced in such a way that the malar bone was partly severed and repair had taken place, leaving a large antero lateral projection on the malar bone. One rib had two articular surfaces at the anterior end.

¹ Smith (d), Fig. 80; (c), p. 423 and Fig. 360.

² Spinden, p. 228.

³ From the interior.

⁴ From the exterior.

DRESS AND ADORNMENT.

Skins. Tanned skin and skin bearing hair of animals, including the deer, and feathers of the woodpecker have been found in the graves and were evidently portions of garments or of pouches; but graves containing these materials are apparently more modern than some of the others. No skins of birds were found by us in this whole region. The scrapers mentioned on page 69 and the hammers as well possibly as the grooved stones mentioned on pages 30 and 75 may have contributed to the making of clothing: the former for scraping skins, the latter for beating and softening them.

Skin (202-8223), resembling buckskin or leather in its decomposed condition, was found in grave No. 31 (2) (99-4326), in the rock-slide near the mouth of Cherry Creek, immediately below Ellensburg. That this grave may not be as ancient as some of the artifacts here described is suggested by the fact that a small piece of a wooden post, not completely decayed, was found projecting from the rock-slide above the grave, and by the presence of four more posts, one at each corner of the grave, extending down from the level of the rock-slide, the upper parts apparently being entirely decomposed. The remains of matting which had been wrapped around the body, glass beads (202-8225) and three bracelets made of iron (202-8226), one of which is shown in Fig. 96, also suggest that this grave was modern, although it must be remembered that in this dry climate, wooden posts, matting and iron resist decomposition for a long time. The form of the garment or other object made up of this skin has not been identified, but pieces of the skin are joined in some places by over-casting with skin thread; in others, with a double skin thong and still in others with some sort of vegetable fibre. A piece of deer skin (202-8230) with the hair on was found in grave No. 37 (4) (99-4328), in the same rock-slide. Here again, the presence of sticks about three feet long, decayed at the tops and arranged in three rows of matting made of reeds (202-8229 and 202-8230, Figs. 71-72), and of beads apparently made of factory-rolled copper, suggest that the entire contents of this grave are modern.

Fragments of skin of a small mammal, with the hair on, which had been stitched along one edge with what appears to be twisted vegetable fibre made into a cord of two strings (202-8231), was found in grave No. 34 (5) (99-4329) in the same rock-slide. Here again were found evidences suggesting the grave to be modern. These consisted of decayed posts cut off at the surface of the slide. Among the other objects in the grave were matting (202-8232), beads (202-8233, Fig. 74), made of what is apparently

factory-rolled copper, coarse string and thong, some of which is wound at the ends and pieces of coarse twisted plant fibre upon which some of the beads were strung, two ornaments (202-8234, Fig. 91) made of haliotis shell, two pendants made of what appears to be factory-rolled copper (202-8235), four bracelets apparently made of similar copper (202-8236, Fig. 95),

a square pendant (202-8238, Fig. 78), a disk (202-8239, Fig. 83), both of which seem to be made of factory-rolled copper and a piece of iron (202-8242). Among the rocks above the grave were found a copper ornament (202-8244), a brass pendant (202-8245, Fig. 84), with thong and copper bead, and a copper pendant (202-8246, Fig. 82).

Matting. Fragments of matting of vegetable fibre sewed or twined with cords made of plant material were found; but only in recent graves. Such graves contained objects introduced into the region since the advent of the whites. These fabrics were probably modern but were in no way affected by the coming of the white man or the materials secured from him, being simply found in these modern graves associated with artifacts made from material secured from the white man. In the old graves they have probably long since decayed. Spindle-whorls were not found. Fig. 70 illustrates the stitch of a piece of matting (202-8391) of a well known type consisting of a single strand warp of rushes pierced at intervals by the weft which is a two-strand string. It is similar to that commonly found in the Thompson River region.¹ This specimen was found in grave No. 38 (1) (99-4333) in a rock-slide on the west side of the Columbia River, near the head of Priest Rapids. The

Fig. 70 (202-8391). Diagram of Stitch of Fragment of Rush Matting. From near the skin on skeleton in grave No. 38 (1) of an adult in a rock-slide on the east side of the escarpment near the head of Priest Rapids. $\frac{1}{2}$ nat. size.

grave was probably modern as is suggested by stakes nearly six feet long which projected about three feet above the surface of the rock-slide and a roll of birch bark² (202-8392). The vegetable fibre used in sewing these stalks was probably the same as that used by the present Indians as was

¹ Telt (a), Fig. 131c.

² Cf. Smith (d), Fig. 117.

thought to be the case in the Thompson River region.¹ Spinden does not mention this simple type of sewed mat as found in the Nez Perce area.² Fig. 71 shows a piece of matting (202-8229) of a new type consisting of two strands of what seem to be small stalks of tule, twisted loosely and pierced at each half turn by a cord. The cord is a two-strand string, the vegetable fibre of the individual strands not seeming to be twisted. The interstices are wide. It was found under the pelvis of a skeleton of a youth (99-4228) in a recent grave, No. 33 (4), in a rock-slide near the mouth of Cherry Creek, below Ellensburg. This piece of matting, so far

a

b

Fig. 71 a (202-8229). Fragment of Matting, made of Twined Rush, stitched together with twisted cord. From under the pelvis of skeleton in grave No. 33 (4) in a rock-slide, near the mouth of Cherry Creek, below Ellensburg. b Diagram of Stitch of a. $\frac{1}{2}$ nat. size.

as I am aware, is the first specimen of a new type collected and figured. It was first brought to the attention of students in 1906 through correspondence when Professor Otis T. Mason stated that he had never seen an example, a picture or a description of just that technique. It was shown at the annual exhibition of the New York Academy of Sciences, in December of the same year, but reference to the type was first published in November 1908 by Spinden.³ In the Thompson River region this type has not been found. Mr. James Teit informs me that he asked all the old Thompson Indian women of the vicinity of Spences Bridge about this type of matting,

¹ Smith (c), p. 423. Teit (a), p. 188.

² Spinden, p. 195.

³ Spinden, p. 195.

submitting a model of it to them which I sent him. They all stated that they never saw that particular type made in the Thompson River region and if ever made there it must have been before the memory of those now living. The only pierced matting made there as far as they have ever known is the tule tent mat,¹ but the strands of this were not twisted, being like those shown in Fig. 70. They had a weave similar to this and the same in general effect in the common mat used for beds and on which to sit, known as the floor mat, but the strands were woven and not stitched.² Certain rush bags of the Quinault and the Makah resemble this type of matting but the rushes are not pierced.

Matting (202-8162) made of tule stalks stitched together with cords twisted to the right, but made of large stalks was found in a recent grave, No. 10 (5) in the rock-slide on the north side of the Naches River, half a mile above its mouth. Part of this was of a similar type and stitched with similar cords and part was of the more common form of sewed matting such as is shown in Fig. 70. This grave had been rifled, and the presence of bark, a portion of a fire drill (202-8157), part of a wooden bow (202-8159), two pieces of a finely woven basket (202-8160) and copper tubes apparently of rolled copper, suggest that it was modern.

Fig. 72 illustrates the technique of a piece of matting of open twine weaving made of rush which was found under the pelvis of the skeleton in grave No. 33 (4) of a youth in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Spinden states that mats were made in the Nez Perce area, of cat-tail stalks held together by two twined cords and that mats were used for house and floor coverings and as sheets upon which to dry berries.³

The string of all these fragments of matting was too much decayed or fragmentary for determination. It will be remembered that both sewed and woven matting were found in the graves of the Thompson River region,⁴ as well as among the living Indians. It seems probable that these mats were made and used one above the other like great shingles for covering the summer house, for beds and for wrapping the dead, while the thinner pieces may have served for garments. Food was probably spread on them to dry and they no doubt served many other purposes. The art of weaving was practised to a considerable extent in the Nez Perce region to the east, although it had very slight development in the Plains area, still further east.⁵

Cord made of vegetable fibre (202-8233) found in grave No. 34 (5)

¹ Telt (a), Fig. 131c.

² Telt (a), Fig. 131d.

³ Spinden, p. 195.

⁴ Smith (c), p. 423.

⁵ Spinden, p. 190.

(99-4329) in a rock-slide near the mouth of Cherry Creek, below Ellensburg, upon which copper and shell beads were strung was made of two strands, some twisted to the right, others, to the left and in some cases a single cord was used for stringing the beads, while in other cases three cords were used.

A roll of birch bark (202-8392) was found in grave No. 38 (1) (99-4333) in a rock-slide, on the west side of the Columbia River near the head of Priest Rapids. It is the only specimen of this kind that was found by us in the whole area although it will be remembered¹ that such rolls of birch bark were frequently found in graves of the Thompson River region. As stated on p. 84, we considered this grave to be modern.

Ornaments. A great variety of ornaments was found, but most of these were in graves considered to be modern. Among the finds which appear to be old, none of them having been found in graves considered to be modern, none of them appearing to be made of commercial material and all of which seem to be of native technique are perforated disks of stone (202-8152), and bone, (202-8227), a perforated and engraved sea shell (202-8388), and haliotis shell from the Pacific Ocean (202-8393), both plain and polished dentalium shells, pendants made of what is apparently haliotis shell, a nose ornament also apparently made of haliotis shell (202-8252), and beads made of shell.

Red and yellow ochre, blue copper clay, and white earth, which may have been used for paint such as was found in the Thompson River region² were not seen by us in this area. Although charcoal, which may have been mixed with grease and used for paint, was frequently found there was no evidence of such use.

Combs. Only one comb was seen and nowhere throughout the area were found any objects known to have been used as head scratchers such as were not uncommon in the Thompson River region.³ The comb (Fig. 73) is made of antler and was found where a creek had washed it out of an old grave at Fort Simcoe. The teeth are convex in outline, the back is nearly straight but not quite parallel with the line of the teeth and the

Fig. 72 (202-8230). Fragment of Open-Twine Matting, made of Rush. From under the pelvis of skeleton in grave No. 33 (4) of a youth in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{4}$ nat. size.

¹ Smith, (d), Fig. 117

² Smith, (d), p. 150, (c), p. 424.

³ Smith, (c), p. 424, Telt (a), p. 312.

ends convex, the rear end being shorter than the other. The nineteen teeth (one perhaps being rather wide to be considered) are set out from each other by grooves on each side of the comb. This edge of the object is somewhat sharpened making the lower end of each tooth resemble the shape of a celt or wedge. Near the back of the comb are three perforations, one in the middle and one at each end, the latter being about equidistant from both the back and the end of the comb. The hole near the short end of the comb was drilled tapering from the reverse, while the two other holes were drilled tapering part way through from each side, but slightly farther from the reverse than the obverse. The specimen is in the



Fig. 73. Comb made of Antler. From a grave at Fort Simcoe. $\frac{1}{2}$ nat. size. (Drawn from photograph 44510, 6-12. Original in the collection of Mrs. Lynch.)

collection of Mrs. Jay Lynch at Fort Simcoe.¹ A comb made of antler was found by us at Lytton² but none were seen among archaeological finds from the other parts of the Thompson River region,³ although wooden combs are found among the Indians there, as in the Nez Perce region where modern combs were made of narrow strips of wood lashed together.⁴ A comb of antler was found by us in the main shell heap at Eburne in the Fraser Delta.⁵

Beads. Among beads, some made of glass are certainly modern. Judging from these glass beads, others found associated with them or with things of white manufacture in the same grave are also modern; while some seem to be old and from sites believed to be ancient. Besides objects truly of the shape of beads, there are others, as for instance the tubes of copper such as are shown in Figs. 74 and 78, some of which were found strung with simple bead forms. Otherwise, they might possibly not have been considered as beads. Fig. 121 suggests how such tubular beads of copper may have been worn on armlets and headdresses. In Fig. 74 are illustrated two fragmentary strings of several types of beads from a number which were found on the neck, arms and legs of a skeleton in grave number 34 (5) in a rock-slide near the mouth of Cherry Creek below Ellensburg. The short cylinders are sections of dentalium shells, longer sections appearing occa-

¹ Museum negative no. 44510, 6-12

² Smith (d), Fig. 83.

³ Smith, (c), p. 424

⁴ Spinden, p. 221.

⁵ Smith, (n), Fig. 42.

sionally. The longest cylinders are sheet copper rolled into cylindrical form. The lapping edge, in most of the beads illustrated is irregular and varies in thickness, which suggests that they were beaten out of native copper rather than cut out of factory-rolled copper. Of course this appearance might be given to the latter by beating it. Such rolled beads made of copper are found in the Nez Perce region to the east¹ and in the Thompson River area to the north.² These shell and copper beads consequently might be considered ancient from their individual appearance, but on the shorter string are some more or less spherical beads made of glass which of course shows that all these beads were used in comparatively recent times. The beads on the longer string are strung upon coarse plant fiber twisted into

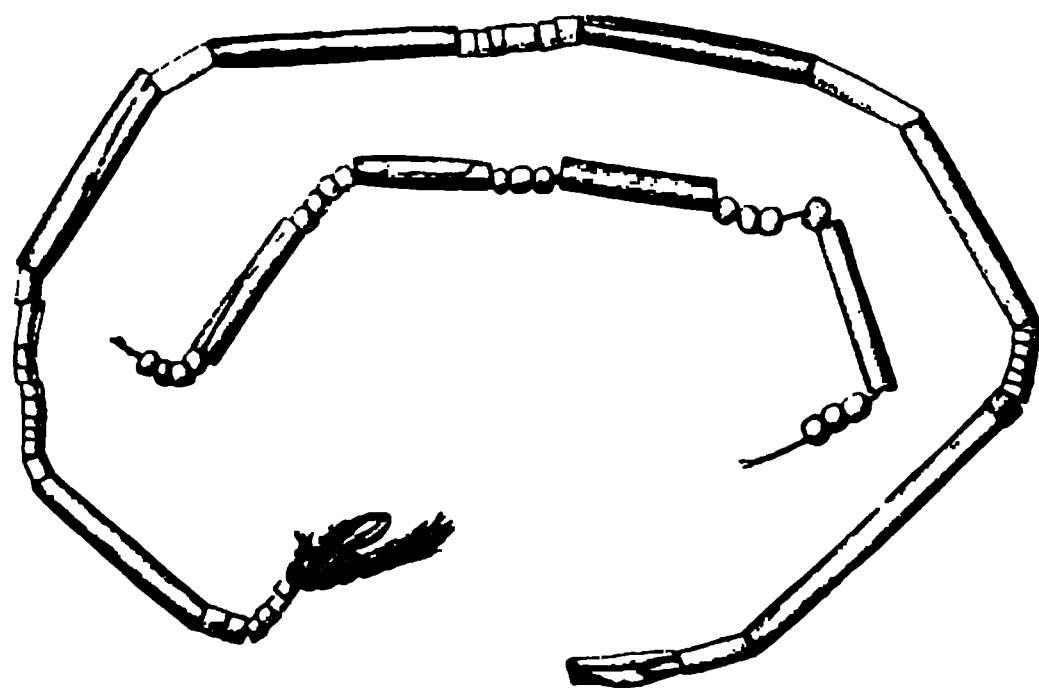


Fig. 74 (202-8233). Beads made of Copper, Glass and Sections of Dentalium Shells. From neck, arms and legs of skeleton in grave No. 34 (5) in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

a two strand string while the shorter string is upon a much smaller fiber also of two strands which are twisted. Some of the other beads in this lot were strung upon thongs.

The tubular bead shown in Fig. 75 is made of brass, proving conclusively that it is recent. It was found in grave No. 1 of the Yakima ridge, which contained a number of other objects that might characterize the grave as ancient were it not for the presence of brass beads. A smaller but slightly shorter brass bead was found with this. It contained a piece of stick, but this may be merely the remains of a rootlet many of which had penetrated into the grave. The edges of the outer fold as well as the ends of the bead are irregular and thinned out similar to the corresponding parts of the copper beads shown in Fig. 74. This suggests that the brass may have been

¹ Spinden, Plate ix, Figs. 16-18.

² Smith, (c), Fig. 371.

pounded into sheets by the natives or at least that factory-rolled brass was pounded by them in manufacturing the bead. It also shows that this characteristic of the edges of copper objects, while it may suggest that they were beaten out of native copper and are consequently ancient, does not prove it. Tubular copper beads with short sections of dentalium shell were



Fig. 75 (202-8148). Bead made of Brass. From grave No. 1 in a rock-slide of the Yakima Ridge. Nat. size.

found mixed all the way from the top to the bottom of grave number 10 (5) in a rock-slide on the north side of the Naches River about half a mile above its mouth. Some of these were slightly larger than those shown in Fig. 74.

The bone tubes shown in Figs. 97 and 98 and those described on p. 105 under games, may possibly have been intended for beads or ornaments. Beads were made of bones of birds in the Nez Perce region to the east.¹

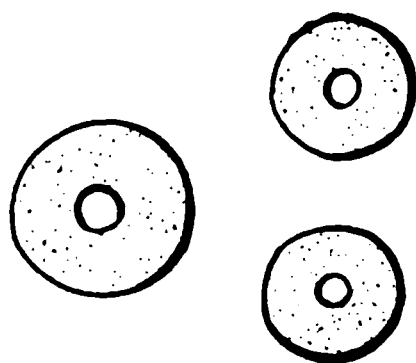


Fig. 76 (202-8384). Beads made of Shell. From refuse of a grave in a rock-slide near the head of Priest Rapids. Nat. size.

The perforated cylinder made of serpentine or steatite shown in Fig. 99 may also have been used as a bead or ornament instead of for gambling. Shell beads of disk shape such as are shown in Fig. 76 were found in three places. Those figured were among the refuse of a grave in a rock-slide near the head of Priest Rapids. Two were found in grave No. 7 (4) in a rock-slide on the northern side of the Yakima Ridge. A brass button and three glass beads were found with them. Twenty-eight of them were found in the

grave of a child in a rock-slide on the west side of the Columbia River near the head of Priest Rapids. All these beads seem to be drilled from both sides or at least each end of the bore is slightly larger than the middle. Somewhat similar disk-shaped beads, apparently made of shell are found in the Nez Perce region to the east,² the Thompson area to the north³ and in the Fraser Delta⁴ of the coast country to the west.

Dentalium Shells. Dentalium shells, some broken or cut into short sections, were found in twelve of the graves of this region. Two of these

¹ Spinden, p. 189.

² Spinden, Plate ix, Figs. 12 and 13.

³ Smith, (d), p. 153; (c), p. 427.

⁴ Smith, (a), p. 179.

graves were in domes of volcanic ash and probably old; five of them were cremation circles, also ancient, while five were rock-slide graves of which three were surely modern, and two probably so. It will be seen that the dentalia beads are found in about equal proportions in old and recent graves, there being seven examples of the former and five of the latter. One lot of dentalia found in a cremation circle was charred. None of the dentalia found in the rock-slide graves were incised while in one of the graves in a dome of volcanic ash incised dentalia were found together with the sculptured human form in antler shown in Fig. 121 on which are represented what appear to be dentalium shells forming parts of ear or hair pendants. Incised dentalia were also found in two of the five cremation circles containing dentalium shells. Some of the incised designs on dentalium shells are shown in Figs. 117 and 118. An idea of how the dentalium shells may have been used as ornaments on arm bands and headdresses may be had by reference to Fig. 121 and p. 101. Somewhat similarly incised dentalium shells were found at the large burial place at Kamloops in the southern interior of British Columbia to the north,¹ and in the Nez Perce region to the east bits of engraved dentalium shells are found in the graves of children.² Strings of them were hung from the ears or fastened to the braids of hair and dentalia were attached to the dresses of the women.³ Among antiquities they are found as far east as central Wyoming. There are some dentalium shells decorated with windings along lines somewhat similar in the collections from the Hupa of California. Dentalium shells used as nose ornaments, ear pendants or parts of ornaments and as beads were also found in the Thompson region.⁴ A few were found on the coast in the Fraser Delta,⁵ but while they are to be seen in collections from living Indians and recent graves they were not found among antiquities elsewhere on the coast of British Columbia and Washington.⁶ It seems noteworthy that while the shells are plentiful on the coast where they are used by the modern people they could only have been obtained in the Thompson River region and the Yakima Valley by barter. In the north, they were imported until recently through the Chilcotin country from the region north of Vancouver Island.⁷ In the Yakima Valley, however, they were probably brought in by a more southern route and from places further south on the coast. My impression is that the Fraser Valley was not used as a route for the importation.

¹ Smith, (c), Fig. 379.

² Spinden, p. 181, Plate ix, Fig. 15.

³ *Ibid.*, p. 220.

⁴ Smith, (c), pp. 425 and 427, (d), pp. 134 and 153.

⁵ Smith, (a), p. 180.

⁶ Smith, (b), pp. 319 and 387.

⁷ Smith, (c), p. 408.

Pendants. Somewhat circular objects which might possibly be considered as beads are shown in Figs. 77 to 80 and are considered as pendants perforated near the centre.

The first is a slightly asymmetrical disk, made of slate, which was found in grave No. 1 in a rock-slide of the Yakima Ridge. It is perforated at the centre with a large hole and at each end with a small hole. These perforations taper from each end and were apparently drilled. On each side there are four conoid pits about equi-distant from each other and the end holes arranged to form an oval about parallel with the edge of the object. On the reverse, there are only two of these pits, one on each side. The disk is 3 mm. thick.

Fig. 77 (202-8152). Drilled and Perforated Disk made of Slate. From grave No. 1 in a rock-slide of the Yakima Ridge. Nat. size.

Fig. 78 illustrates a thin square of copper with rounded corners, a thong of skin and a copper bead, found in grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek below Ellensburg. The hole in the centre of this little pendant has been punched. The presence of glass beads and iron in the same grave suggests that possibly this copper pendant was made of factory-rolled metal.

The object shown in Fig. 79 is a sort of button made of shell attached to



Fig. 78



Fig. 79.



Fig. 80.

Fig. 78 (202-8238) Pendant made of Copper, Thong and Copper Bead. From grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Nat. size

Fig. 79. Button made of Shell with Attached Bead made of Metal. From an Indian at Ellensburg. Nat. size (Drawn from photograph 44506, 6-7. Original in the collection of Mr. McCandless.)

Fig. 80 (202-8227) Perforated Disk made of Bone. From grave No. 31 (2) of a child in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Nat. size.

which is a metal bead. It was secured from an Indian at Ellensburg and is in the collection of Mr. McCandless.¹ The edge of the shell disk is

¹ Museum negative no. 44506, 6-7.

rounded. There are two perforations through the disk, one a short distance from the centre. The other is in the centre, into which the metal bead is welded. The hole in the bead is parallel to the surface of the shell disk but does not go through the bead.

Fig. 80 illustrates a disk of bone about 1 mm. thick found in grave No. 31 (2) of a child in a rock-slide near the mouth of Cherry Creek below Ellensburg. The edge is rounded, the perforation has straight sides and is slightly worn at the ends. This, together with certain faint parallel grooves running diagonally across the grain of the bone suggests that the object may be a portion of a factory-made button.

Pendants perforated at the end or edge are shown in Figs. 81 to 94, arranged according to material, as stone, copper, brass, iron and shell. Fig. 81a illustrates a pendant made of slate which was found with five others in a grave on McNeals Island near the mouth of the Yakima River by Mr.



Fig. 81. Pendants made of Slate. From McNeals Island near the mouth of Yakima River. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original catalogue No. 45 in the collection of Mr. Janeck).

Janeck. It is 52 mm. long, 3 mm. thick by 24 mm. wide. The upper end is narrower than the lower and perforated closer to the end of the object than to the side edges. The perforation tapers from each side and shows striations caused by drilling. The lower end of the pendant is somewhat thicker than the upper end.¹ The pendant shown next in the figure bears the same catalogue number in Mr. Janeck's collection and was one of the same lot of six specimens. It is 70 mm. long by 19 mm. wide and 3 mm. thick, is made of slate and similar to the other five specimens except that it bears six notches spaced about equi-distant from each other on one edge, and that the perforation is irregular, apparently having been broken through rather than drilled. The edges of this pendant are rather flat and the lower end is bevelled off somewhat from each side like a celt. This pendant may have been made to represent the tooth of an animal.²

¹ It is No. 45 in the collection of Mr. Janeck and Museum negative no. 44503, 6-4.

² Museum negative no. 44503, 6-4.

A pendant made of steatite and bearing an incised design in which part of the lines and holes are colored with red paint (mercury) is shown in Fig. 119. This was found on the manubrium of an adult skeleton supposed to be that of a man, in a grave covered with rocks on a low ridge about two and a half miles south of Fort Simcoe. The object is not necessarily recent because the coloring matter being mineral may have lasted a long time. In outline, it is of the form of a tall truncated pyramid. It is only about 6 mm. thick and its edges are rounded or somewhat sharp. Across the base of the side shown in Fig. 119a extends a ridge which on the opposite side of the specimen is raised for only a short distance on the left. The Agency physician is of the opinion that the grave was very old and that steatite does not occur near by but that the material must have been brought from Puget Sound. As the character of the art more closely resembles that of the Thompson River region where steatite is frequently found, at least in the form of artifacts, it would seem that the material more likely came from there, if indeed it was not from a nearer source, perhaps in this very valley. The specimen is in the collection of Mrs. Lynch.

Fig. 82 illustrates a long pendant made of copper found about one foot deep among the rocks over grave 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek below Ellensburg. The perforation at the top is punched, which together with the fact that glass beads and a piece of iron were also found in this grave, suggests that the copper is factory-rolled. The edges are rounded and thinned, possibly by disintegration, to almost a cutting edge. The thong by which it was suspended is of skin and attached by being passed through the perforation and looped through a slit in the tip of the thong. Two somewhat similar pendants, (202-8235a, b) made of copper, were found near the legs in this same grave. The first is narrow at the top which is slightly concave in outline, and the perforation is punched. The sides are nearly straight. The lower end is about three times as wide as the top and is deeply concave in the middle and convex in outline from this concavity to the side edges. In each of the concavities is a notch. These suggest that they are worn out perforations from which other pendants may have been suspended. The second pendant is of almost the same size and shape as that shown in Fig. 82. It has a somewhat fluted lower end but this characteristic may be partly the result of worn and decomposed perforations or merely of decomposition. The perforation at the top was punched and still retains a fragment of a leather thong. A small triangular pendant only 18 mm. in length, made of copper, (202-8251) was found inside the skull of a child in grave No. 37 (8) in a rock-slide near the mouth of Cherry Creek. It is perforated near the most acute angle and also through the base. The perforations seem to have been punched and the corners have been

rounded, possibly by decomposition. Fig. 83 shows a thin disk-shaped pendant made of copper from the same grave as the one shown in Fig. 82. The perforation near the upper edge is also punched. A fragment of copper (202-8185) was found in the northwestern part of cremation circle No. 17 (12) on the terrace northwest of the mouth of the Naches River. This may be a fragment of a copper ornament. It, and the specimen found in circle No. 15 constitute the only finds of copper which were made in cremation circles. In its decomposed state it does not look like factory-rolled copper

Fig. 82.

Fig. 83.

Fig. 84.

Fig. 82 (202-8246). Pendant made of Copper. From about one foot deep among the rocks over grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

Fig. 83 (202-8239). Pendant made of Copper. From grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Nat. size.

Fig. 84 (202-8245). Pendant made of Brass and Bead made of Copper. From about one foot deep among the rocks over grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

and may be native. The other fragment (202-8181) found in cremation circle No. 15 (10) at the same place may be factory-rolled copper. In the Nez Perce area to the east, small pieces of copper were attached to the dresses of women.¹

The pendant shown in Fig. 84, also found near the one shown in Fig. 82 was made of brass. There are two perforations near the upper edge the larger one of which is not circular and a perforation tapering more from the

¹ Spinden, p. 220.

concave side than from the other as well as a notch at the lower edge. The peculiarities of these perforations suggest that they were gouged out. The object is slightly concavo-convex. A skin thong is attached to the larger perforation at the upper edge by looping as in the case of the pendant shown in Fig. 82. On this is strung a cylindrical copper bead.

Fig. 85 illustrates a pendant made of iron found in grave No. 35 (6) of a youth in a rock-slide near the mouth of Cherry Creek, below Ellensburg. The next figure represents one of thirteen cone-shaped bangles or pendants also made of iron, found in the same grave. These were made by bending a thin sheet of the metal into the conical form.

The remaining pendants are all made of shell. The one shown in Fig. 87 is a natural olivella shell with the top of the cone missing and found in grave No. 39 (1) of a child in a rock-slide near the head of Priest Rapids.



Fig. 85



Fig. 86.



Fig. 87.

Fig. 88.

Fig. 85 (202-8249a). Pendant made of Iron. From grave No 35 (6) of a youth in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

Fig. 86 (202-8248a). Pendant made of Iron. From grave No. 35 (6) of a youth in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat size.

Fig. 87 (202-8393). Pendant or Bead made of an Olivella Shell. From grave No. 39 (1) of a child in a rock-slide near the head of Priest Rapids. Nat. size.

Fig. 88 (202-8388) Pendant made of (*Pectunculus*) Shell. From grave of a child in a rock-slide west of Columbia River, near the head of Priest Rapids. Nat. size.

A shell somewhat similar to this made into a bead was found in the Nez Perce region.¹ The pendant shown in Fig. 88 was found in the grave of a child in a rock-slide west of the Columbia River near the head of Priest Rapids. It is made of a small marine clam shell (*Pectunculus*), probably a young *Pectunculus gigantea*. The perforation passes through the apex and has apparently been gouged from the outside. The ribs on the convex surface of the shell have been nearly effaced by grinding or polishing and the hinge also seems to have been smoothed so that only slight scars mark the depths of the teeth. This shell certainly came from the Pacific Coast either in its natural condition or after having been made into this form. It

¹ Spinden, Plate 1x, Fig 14.

is the only object made of this kind of shell which I have seen in the whole northwest. The pendant shown in Fig. 89 is made of iridescent shell possibly unio but probably haliotis. If the latter, it must have come from the Pacific Coast. It was found in the same grave. This grave contained no objects of white man's manufacture or anything suggesting that it was modern. A list of its contents will be found on p. 169. This pendant is of the form of an isosceles triangle. It is perforated through the more acute angle by a small hole which tapers as if drilled from each side of the object. The edges of the pendant are rather sharp in places and the lower one is concave in outline. This object may be compared with the pendant made of bone, found at Lytton,¹ which was considered to be a sap scraper.²

The pendant shown in Fig. 90, from grave No. 37 (8) of a child in a rock-slide near the mouth of Cherry Creek below Ellensburg, is made of haliotis shell which must have come from the coast and is rectangular in outline with slightly worn or rounded corners. The perforation at the top is larger at each end, while the one in the side is much larger on the convex side and only slightly larger on the concave side than in the middle. This perforation has been broken out. A somewhat similar pendant but smaller and with only an end perforation (202-8256) was found together with the shell pendant described on p. 98 near the lower jaw in the same grave. A larger pendant of this general rectangular form, with worn or rounded corners, perforated near the middle of one end, and with a second perforation lower down (202-8254) was found with this. One perforation is larger at one side of the object, the other at the other side. Three somewhat similar pendants or fragments of such pendants, one with the perforation broken out, another with a single perforation and still another with a double perforation like the one just described (202-8183) except two dentalium shells were the only shell ornaments found in cremation circle No. 17 (12) on the flat northwest of the mouth of the Naches River. These were in the northeastern part of the circle. In the northern and northwestern parts of cremation circle No. 15 (10) on this same flat were found a number of such pendants and fragments of pendants which have only one perforation so far as can be identified.

A much decomposed and fragmentary piece of shell, apparently of claw shape with a perforation at the base, several other pieces of similar shape and two triangular pieces of shell (202-8180-82) all of which were apparently burned, were found in cremation circle No. 14 (9) at the same place. A fragment of a shell ornament (202-8189) was also found in cremation circle No. 21 (16) at this place.

¹ Smith, (d), Fig. 95.

² Smith, (c), p. 441; (b), Fig. 109.

The pendant shown in Fig. 91 is nearly of disk form and made of *haliotis* shell. It is perforated at the more convex edge and was found with one very much like it in grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek. One was near the head and the other near the pelvis. Another specimen and a fragment of still another (202-8257a, b) and several other small fragments of decomposed shell (202-8258) were found near the lower jaw in grave No. 37 (8) in a rock-slide near the mouth of Cherry Creek.



Fig. 89.

Fig. 90.

Fig. 91.

Fig. 92.



Fig. 89 (202-8386). Pendant made of Iridescent Shell. From the grave of a child in a rock-slide west of Columbia River near the head of Priest Rapids. Nat. size.

Fig. 90 (202-8255). Pendant made of (*Haliotis*) Shell. From grave No. 37 (8) of a child in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Nat. size.

Fig. 91 (202-8234b). Pendant made of (*Haliotis*) Shell. From grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. Nat. size.

Fig. 92 (202-8252). Pendant or Nose Ornament, made of (*Haliotis*) Shell. From grave No. 37 (8) of a child in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

The pendant or nose ornament shown in Fig. 92 is made of shell which in its much decomposed condition appears to be *haliotis*. This object was found on the lower jaw of a very much decomposed skeleton of a child in the same grave. The fact that a piece of copper, apparently factory-rolled, (202-8251) was found inside the broken skull suggests that this grave was modern. The object is nearly circular in outline, although slightly wider than high. The sides have disintegrated or were rounded off, to a rather sharp edge. There were apparently three perforations near the upper edge of the object, and it is broken so that it is impossible to see whether they were perforations for suspension or were made merely as a means of

cutting out a portion of the shell in such a way that it could be clasped on to the septum of the nose. Portions of this specimen and several other shell objects, found in the same grave were of a peculiar pink color.

The shell shown in Fig. 93 was found near the neck at the south side of an adult skeleton in grave No. 12 (7) covered with pebbles in the bluff on the north side of the Naches River about 12 miles above its mouth. It has two perforations and what appears to have been a third perforation now broken out. A somewhat similar circular shell pendant which appears to have been made from the shell of the oyster was found with this and is shown in Fig. 94. One of these pendants was at the south shoulder, the other at the south side of the skull. A piece of wood in this grave suggests

Fig. 93.

Fig. 94.

Fig. 93 (202-8171). Pendant made of Shell. From near neck at south side of adult skeleton in grave No. 12 (7) covered with pebbles in bluff on north side of Naches River about twelve miles above its mouth. Nat. size.

Fig. 94 (202-8170). Pendant made of Oyster Shell. From near neck at south side of adult skeleton in grave No. 12 (7) covered with pebbles in bluff on north side of Naches River about twelve miles above its mouth. Nat. size.

that it may not be an old one and that these disks may have been obtained from traders. The grave was apparently unique. The lower part of the inner decoration on each side of the face shown in Fig. 121 probably represents a shell pendant for the ear or hair. Disks of *haliotis* shells were used as ear pendants in the Nez Perce region to the east.¹

Bracelets. Bracelets are shown in Figs. 95 and 96. The one shown in Fig. 95 represents four of about the same size, all made of copper and from the arm of the skeleton found in grave No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek. The presence of glass beads in this grave suggests that the bracelets may be of drawn copper. They are not made of wire but seem to be rolled out of rather thick sheet copper. The edges of

¹ Spinden, p. 220.

the fold are somewhat irregular but I do not consider that this proves the material to be native copper. The bracelet shown in Fig. 96 is one of three made of iron found in grave No. 31 (2) of a child in a rock-slide near the mouth of Cherry Creek. The use of armlets of skin decorated with shells or quills is suggested by the incisions on the arms of the costumed human figure made of antler shown in Fig. 121. In the Nez Perce region to the east arm and leg bands were worn ¹ while in the Thompson area dentalium shells were sometimes fastened parallel to each other on arm bands.

A Costumed Human Figure. A costumed human figure made of antler ² is shown in Fig. 121. It was found in grave No. 25³ in a dome of volcanic ash near Tampico. There was nothing to indicate that the grave

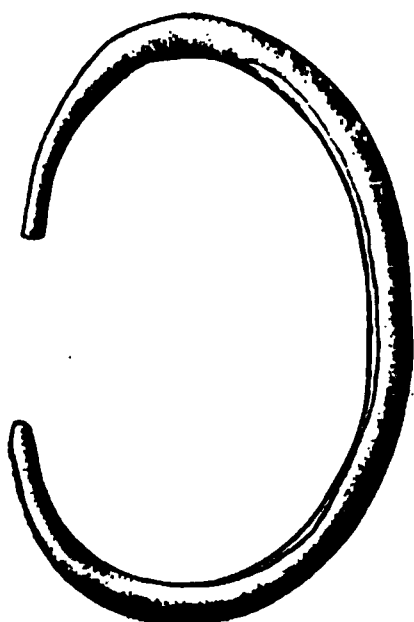


Fig. 95.

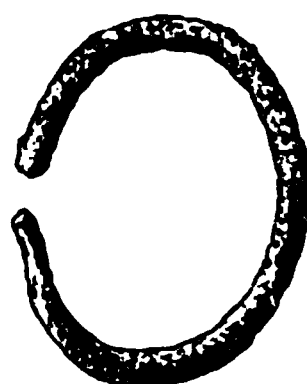


Fig. 96.

Fig. 95 (202-8236b). Bracelet made of Copper. From arm of skeleton No. 34 (5) of an infant in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

Fig. 96 (202-8226). Bracelet made of Iron. From grave No. 31 (2) of a child in a rock-slide near the mouth of Cherry Creek, below Ellensburg. $\frac{1}{2}$ nat. size.

was recent and so this gives an idea of the costume, but possibly merely of ceremonial costume as formerly worn in this region. It apparently shows a feather headdress like that of the present Indians of the region and as far east as the Dakotas; the hair dressed and ornamented with dentalium shells, the arms, body, legs and feet apparently bare and ornamented with ceremonial paintings and about the waist a fringed apron. The general style of the costume indicated is unlike that of the northwest coast but resembles that of the plateaus to the south and the Plains to the east. Above the face is a zigzag line which may represent tattooing, painting or a head-ring. Spinden says that tattooing was not practised in the Nez Perce region to the east ⁴ but Teit reports it as practised in the Thompson River region ⁵ where

¹ Spinden, p. 219.

² Cf. p. 127.

³ See Plate x.

⁴ Spinden, p. 222.

⁵ Teit (a), pp. 228 and 321.

he supposed that when applied to the wrists the custom was derived from the coast tribes.¹ Head-rings among the Thompson River Indians were decorated with dentalium shells.² In the Nez Perce region³ the face and body were painted, red and yellow being much used for this purpose. In the Thompson River area⁴ the face and body were painted with several shades of red, head-bands being painted across the brows.

The zigzag is a common form of decoration of the head-bands among the Sioux. Above the zigzag arranged in a semi-circular row, are certain oblong forms which indicate feathers. The middle form, however, is marked with a circle. Both above and below this row are three incised lines forming an ark. Based on the outer one of these incisions are isosceles triangles slightly in relief. If these triangles represent the feathers of the headdress, they are certainly in the correct position. Between them are incised arks forming hachure parallel to the arks previously mentioned. Two of these extend above the tips of the triangles. Beyond this, much of the object is missing, but to the right may be seen a surface similar to the areas interpreted later on as hair ornaments. Further evidence of the use of such a headdress is offered by the red and white pictographs and by the petroglyphs of this region, samples of which are shown in Plates XI, XIV-XVI.

On each side of the face is what is apparently a hair ornament, perhaps made of buckskin, which was attached to the rolled up braids or curls of the front hair on each side of the head and hung down as in this representation. The three horizontal bands of vertical lines apparently represent dentalium shells although they may be intended for tubular copper or bone beads, while the oval figure at the bottom of each of these flaps probably represents a pendant of haliotis shell. Shell ornaments in the Thompson River region were sometimes of similar proportions and shape. Such hair ornaments were used until recently in the Thompson River region to the north where they were of different types and differed in the richness and style of their ornamentation. One of the common styles was to cover the flap of buckskin thickly with rows of the largest dentalia placed vertically side by side. Mr. James Teit informs me that the outer portion of the figure, bearing five bands of vertical lines, evidently represents part of the headdress and the buckskin flaps such as were worn in the Thompson River region attached to the sides of the head-bands. These were ornamented generally with dentalia among the women and more commonly with designs embroidered with quills or made with paint among the men. In the Nez

¹ See Report of the British Association for the Advancement of Science, 1890 p. 590.

² Teit, (a), 351.

³ Spinden, p. 222.

⁴ *Ibid.*, pp. 228 and 268.

Perce region¹ ear pendants in the form of disks were made from haliotis shells and strings of dentalia were hung from the ears or fastened to the braids of hair and dentalia and small pieces of copper were attached to the dresses of women. These vertical bands, however, may represent the lines of attachment of additional hair by means of glue covered with lime in which manner the hair is dressed by some Plains tribes. Below the nose are faint suggestions of an ornament possibly similar to the shell pendant shown in Fig. 92.

The two ridges, extending from near the chin to the shoulders, seem to indicate collar bones. The body is thin and narrows downward. Paint or tattooing, representing the ribs, or the ribs themselves, are indicated by ridges. There are horizontal hachure on the body above the waist. The arms are separated from the body by incisions made from both the front and the back, and the outer edges of the object, being rounded off, are like portions of a carving. A bracelet, band, or figure painted or tattooed, on the apparently bare arm is indicated in the middle of each by vertical hachure connecting pairs of parallel lines. The vertical arrangement of lines of the horizontal band suggests that these were arm bands, bearing vertically arranged copper or shell beads, if not dentalium shells similar to those which are supposed to be represented by the bands of vertical lines on the headdress on each side of the face. Mr. Teit considers the bands around the elbows as representing armlets of skin embroidered with dentalia or quills like those formerly used in the Thompson River region, although the Indians there were in the habit of painting their bodies in imitation of clothing. Head-bands were painted across the brows, fringed kilts or aprons around the middle and upper part of the legs and fringed short leggings along the lower part of the legs. The fringes were represented as long. Imitations of wristlets, armlets and anklets were also painted on the body. As before mentioned, arm and leg bands were worn by the Nez Perce Indians² and as indicated by the previously described specimens, bracelets were worn in the Yakima area. At the wrist is a slight horizontal incision, where the hand expands somewhat sidewise. The fingers and thumb are separated by four vertical incisions. Below these and extending across the body are four horizontal lines, the space between the two in the middle being slightly wider than the other two spaces. These lines seem to indicate the upper edge of an apron which is covered by vertical hachure.

The legs begin at the bottom of the apron from which they are set off by

¹ Spinden, p. 220.

² Spinden, p. 219.

two horizontal incisions. The apron at the outline of the object projects slightly beyond them. On each leg are five incised isosceles triangles,—three at the top and two at the bottom, with their long points extending towards the knees. At each side of the lower triangles is one line which seems to represent a continuation of the designs around the legs. On each triangle are horizontal hachure. On both knees are faint traces of two concentric incisions, forming figures with rounded corners and bulging sides. Between these are radiating hachure. Close inside is a concentric incised line and there may be seen two parallel lines, nearly horizontal, above the right knee and one below it, and one above the left knee. The triangles may be considered as pointing from these concentric designs rather than towards them, and in that case the lines, suggesting the continuation of the design around the leg, appear at the top instead of the bottom. It does not seem probable that these triangles represent part of a circular design radiating from the knees, the sides of which are folded around the legs, but rather that the two series of triangles extend horizontally. The incisions on the legs probably represent painting or tattooing, since the designs seem to be horizontal and to extend all around the legs, while on leggings the patterns are usually vertical and on a flap at the outer side of the leg, the knee being disregarded. Catlin¹ figures paintings on the arms and legs of the Mandan similar to the patterns on this carving. The custom is not rare, especially in connection with elaborate ceremonial costumes such as are no doubt represented by this figure. The vertical incisions on the feet probably represent the toes, or designs painted or tattooed on the feet. These lines argue against any idea that the feet are encased in moccasins, unless bead or quill work on, or improbable wrinkles in, the moccasins are indicated by them. Porcupine quills, embroidery, beadwork and painting on moccasins were used in the general plateau region of which this is a part.²

Lewis suggests³ that the tribes depending largely on the hunt, would be better supplied with skins for clothing than those subsisting generally on fish, and that in most of the plateau region, the scanty vegetation makes clothing from plant materials difficult, if not practically out of the question. In this connection, it will be remembered that this carving of antler which gives us our general archaeological information regarding ancient costume, comes from the higher or hunting region of the valley. It will also be remembered that sage brush and other plant materials were used for clothing in the Thompson River region to the north, where the vegetation is nearly as scanty as in the Yakima Valley.

¹ Catlin, Plates v and vi.

² Lewis, p. 190.

³ Lewis, p. 189.

Perhaps some suggestion as to the sex of the individual which this figure was intended to represent may be gleaned from the fact that in the Nez Perce region the costume of the men differed greatly from that of the women. The former wore moccasins, leggings, breech clout, shirt, blanket, and also the war-bonnet, while the latter wore moccasins, a long loose gown and a fez-shaped cap made of basketry, also occasionally leggings and less decoration on their costume than on that of the men. The ornamentation consisted of fringes, bead and quill work, shells, elk teeth, beads, and copper.¹ The men's clothing was decorated with fringes, and some with beads, porcupine quills and paint. Considering this figure from these facts it would seem that it was clearly intended to represent a man.

Some feathers of the flicker (202-8243) were found in grave No. 34 (3) in a rock-slide near the mouth of Cherry Creek. One of them had bound to its tip a little piece of fabric, another a bit of fur. These may have been part of a costume or ceremonial paraphernalia.

Of the different articles of clothing worn by the Nez Perce, Lewis says,² "These are formed of various skins and are in all respects like those particularly described of the Shoshones." Along the Columbia, the similarity was not so complete,³ but as far down as the Upper Chinook many articles described as similar to those of the Shoshone were found.⁴ All these, however, they declared were obtained by trade from other tribes and from those who sometimes visit the Missouri.⁵ According to Lewis,⁶ the clothing and equipment of the Shoshone living on Lemhi and Salmon Rivers in Idaho were much the same as the Plains type, and it is quite probable that they had formerly lived farther east. There are two certain indications that this extensive introduction of eastern clothing took place about the time of Lewis and Clark's visit. When they went down the Columbia in 1805, they found the women wore quite a different dress, consisting merely of a breech clout of buckskin with occasionally the addition of a small robe of skin.⁷ This is exactly the same dress as was worn by the Chinook women above the mouth of the Willamette.⁸ When these explorers returned up the Columbia the following year they found the Indians particularly the women, much better dressed, and in the eastern or Shoshone style.⁹ A few years

¹ Spinden, p. 216.

² Lewis and Clark, V, p. 30.

³ *Ibid.*, III, p. 125, IV, p. 317.

⁴ *Ibid.*, IV, pp. 239, 284, 289.

⁵ *Ibid.*, IV, 303.

⁶ Lewis, p. 188.

⁷ Lewis and Clark, III, pp. 125-137, and 143.

⁸ Lewis, p. 189.

⁹ Lewis and Clark, IV, pp. 322 and 337.

later, Cox¹ mentioned the older type of dress as found only among a few miserable tribes along the Columbia, above the mouth of the Yakima.²

Deformation. All of the skulls secured in this area by our party showed antero-posterior deformation, although not so extreme as is found in the Lower Columbia region. Accompanying this in many cases was a concave depression in the anterior parietal region. The flattening of the head was practised to a limited extent by tribes living along the Columbia River above the Chinook, but limited, according to Lewis, almost entirely to the women, and gradually died out towards the east.³

GAMES, AMUSEMENTS AND NARCOTICS.

Games. Dice made of beaver teeth or woodchuck teeth, such as were found in the Thompson River region,⁴ but which were not found in the shell heaps of the Lower Fraser, or in fact, in any of those of the coast of Washington or British Columbia, were absent among our finds in this region although a beaver tooth was seen in the cremation rectangle No. 21 (16) near the mouth of the Naches River.

A number of small tubes, made of bone which may have been used in gambling, were found here. Four of them, about 42 mm. long and 9 mm. in diameter, with the ends ground squarely across, but with the edges somewhat rounded possibly by wear, were found in the east northeastern part of the bottom of grave No. 10 (5) in a rock-slide on the north side of the Naches River about half a mile above its mouth. Fig. 97 shows one of two other bone tubes of similar size and shape, the ends ground somewhat more perfectly flat, which were found in grave No. 1, in the rock-slide on the north side of the Yakima Ridge to the southeast of the Yakima River. Another bone tube from this same grave (Fig. 98) is 43 mm. long and 12 mm. in diameter, and the ends are ground off flat. This bears nine about equidistant incised lines, which run around it in such a way that the lower end of each line is on the opposite side of the bone from its upper end. It is charred. Such bone tubes were found at Lytton,⁵ in pouches in the graves, in other parts of the Thompson River region⁶ to the north and in the shell

¹ Cox, p. 229.

² Lewis, pp. 188-189.

³ Lewis, p. 180; Lewis and Clark, III, pp. 125 and 137; IV, p. 324; Hale, p. 213; Whitman, pp. 91 and 95 (1891).

⁴ Smith, (d), Fig. 100; (c), p. 428.

⁵ Smith, (d), p. 154.

⁶ Telt, (a), p. 275.

heaps of the Lower Fraser River ¹ to the west. In the Nez Perce region dice and gaming pieces were commonly made of bone.² Cylindrical sections of the long bone of the deer were used in gambling,³ and whistles were made of the long bones of the sand hill crane.⁴

The perforated cylinder shown in Fig. 99, made of serpentine is 44 mm. long and 8 mm. in diameter, rounded at the edges and was found in about the centre of grave No. 10 (5). There are five small pits about equi-distant from each other around this cylinder near the top, and four near the bottom. There are two transverse incised lines just below the five pits, and there is an incision about 12 mm. above the bottom of the specimen, below which the diameter is perhaps half a mm. greater than at the top. Near the middle



Fig. 97.



Fig. 98.



Fig. 99.

Fig. 100.

Fig. 97 (202-8150). Bone Tube. From grave No. 1, in a rock-slide of the Yakima Ridge. $\frac{1}{2}$ nat. size.

Fig. 98 (202-8151). Bone Tube, bearing Incised Lines, Charred. From grave No. 1 in a rock-slide of the Yakima Ridge. $\frac{1}{2}$ nat. size.

Fig. 99 (202-8166). Perforated Cylinder made of Steatite. From near centre of grave No. 10 (5) in a rock-slide near the mouth of Naches River. $\frac{1}{2}$ nat. size.

Fig. 100. Tubular Pipe made of Steatite. From Yakima Indians. $\frac{1}{2}$ nat. size. (Drawn from photograph 44506, 6-7. Original Catalogue No. 215 in the collection of Mr. McCandless.)

of the object it is pierced by a hole which tapers from each end. While this object also may have been used in gambling, it seems possible that it may be an amulet.

Narcotics. Pipes of seven distinct types were found in this region; a tube, a simple bowl, a disk with both bowl and stem made in the periphery, an elbow form, a modern inlaid pipe similar to the typical form of the catlinite pipe of the Plains, a tomahawk-pipe in stone, and a pipe carved in the art of the North Pacific coast.

A tubular pipe made of steatite is shown in Fig. 100. It was collected by Mr. Frank N. McCandless from the Yakima Indians. Mr. McCandless

¹ Smith, (a), p. 180.

² Spinden, p. 189.

³ Spinden, p. 254.

⁴ Spinden, p. 189.

says the stone differs from that found at the head of Wenatchee Lake, which is sometimes used for pipes in this region. This pipe is No. 215 in his collection deposited in the Ferry Museum in the City Hall at Tacoma. It is 51 mm. long and the bowl has been broken off irregularly, about half of it apparently having been broken away. The bowl flares rather more abruptly than is the case in the pipes usually found either in this region or that of the Thompson River. In this respect it resembles the tubular pipes made of steatite, found on the coast of British Columbia.¹ In outline, it is nearly straight, while most pipes of this type have bowls convexly curved in a form characteristic of the type found in the interior of British Columbia and of Washington. The bowl has been gouged out. There is a ridge or ring around the pipe where the bowl meets the stem. Oblique incisions slanting downward from left to right, at an angle of about 45°, mark this ridge, making it suggest a twisted cord. The end of the stem is similarly marked. These lines are again mentioned under art on p. 125. The stem expands from the ridge to the end. The outline of the stem is rather straight or



Fig. 101. Tubular Pipe made of Green Stone with Stem. From Lemhi River, Idaho. (Reproduced from p. 342, Vol. II, Lewis and Clark. Bowl about 2½ inches long.)

slightly concave, while most pipes of this type have more slender or nearly cylindrical stems. The interior of the stem was apparently formed by whittling. The pipe is stained by tobacco which suggests that while it may be old, it has nevertheless been recently smoked.² In the Nez Perce region to the east the earliest form of pipe, according to Spinden, was doubtless the straight tubular type.³ One of the pipes figured by him has a flange for a mouthpiece similar to those found in the Thompson River region, and this flange is perforated near one end. This particular type of pipe is also found in Oregon.⁴ A pipe of this type, but which much more nearly resembles the typical form of tubular pipe of this region, especially the shorter specimens, is reproduced in Fig. 101 from Lewis and Clark.⁵ This specimen which is made of green stone and has a stem, was seen among the Shoshone Indians at the headwaters of the Lemhi River, Idaho, by Lewis, August thirteenth,

¹ Smith, (a), Figs. 48 and 55; (b), Fig. 139.

² Museum negative no. 44506, 6-7.

³ Spinden, p. 188, Figs. 4 and 5, Plate ix.

⁴ Moorehead, Fig. 457, p. 316, Figs. 9, 17, 22 and 25.

⁵ Lewis and Clark, II, p. 342.

1805. It marks the eastern limits of the occurrence of this type of pipe, so far as I am aware at present, the short forms having been found at Fulford Harbor, North Saanich, Sidney¹ and Port Hammond,² on the southern coast of British Columbia, Damon³ on the coast of Washington, Lytton⁴ in the interior of British Columbia, Umatilla⁵ and Blalock Island,⁶ near Umatilla, both in the interior of Washington. In the Journal for Tuesday, August 13, 1805, Lewis refers to this pipe, as follows: — "the chief then lit his pipe at the fire kindled in this little magic circle . . . pointed the stem to the four cardinal points of the heavens first begining at the East and ending with the North. he now presented the pipe to me, as if desirous that I should smoke, but when I reached my hand to receive it, he drew it back and repeated the same c[e]remony three times, after which he pointed the stem first to the heavens then to the center of the magic circle smoked himself with three whifs and held the pipe untill I took as many as I thought proper; he then held it to each of the white persons and then gave it to be consumed by his warriors. this pipe was made of a dense simitransparent green stone very highly polished about 2½ inches long and of an oval figure, the bowl being in the same direction with the stem. A small piece of birned clay is placed in the bottom of the bowl to seperate the tobacco from the end of the stem and is of an irregularly rounded figure not fitting the tube perfectly close in order that the smoke may pass. this is the form of the pipe. their tobacco is of the same kind of that used by the Minnetares Mandans and Ricares of the Missouri. the Shoshonees do not cultivate this plant, but obtain it from the Rocky mountain Indians and some of the bands of their own nation who live further south." ⁷

Mr. James Teit informs me that a flange like the end of a spool at the mouth of the stem of a tubular pipe, makes it of a type which seems to him peculiarly characteristic of the Thompson River region. In some cases this peculiarity is carried over into the stems of pipes of the modern or elbow type, which have wooden stems, as is shown in Fig. 102. Mr. Teit has never seen or heard of tubular pipes from the Thompson River region with holes through the flanges. It seems possible that the hole in such specimens as one from Umatilla, Oregon,⁸ may have been made for the attachment of ornaments or symbolic material such as feathers or for a cleaner. Ornaments were sometimes attached to pipes of the elbow type in the Thompson River

¹ Smith, (b), Fig. 139.

² Smith, (a), Fig. 48.

³ Smith, (b), Fig. 139.

⁴ Smith, (h), p. 34.

⁵ *Ibid.*, Fig. 7.

⁶ *Ibid.*, p. 36.

⁷ Lewis and Clark, II, p. 341.

⁸ Smith, (h), Fig. 7a.

region. This was done by tying in a hole bored through the hatchet-shaped piece underneath the shank close to the elbow. Pipes of the simple bowl type often had an extension at the foot of the bowl, sometimes perforated, to which ornaments could be attached. On the other hand, the hole may have been to facilitate attaching the pipe to its wooden stem. The pipes that have been perforated through the flange,¹ however, seem to have too small a bore for a wooden stem; yet, a pipe of this type with a wooden stem has been shown in Fig. 101. One reason given Mr. Teit by the Indians for the making of the flange or other thickening at the mouth of the pipe stem was to prevent the string used in attaching the pipe to the wooden stem slipping off. According to all of them, wooden stems were always used with tubular pipes as with elbow and simple bowl pipes; for a person cannot smoke any kind of stone pipe more than a few draws before it becomes too hot for the lips. To Mr. Teit's mind, no matter how small the bore of the pipe, a regular stem must have been used for smoking.

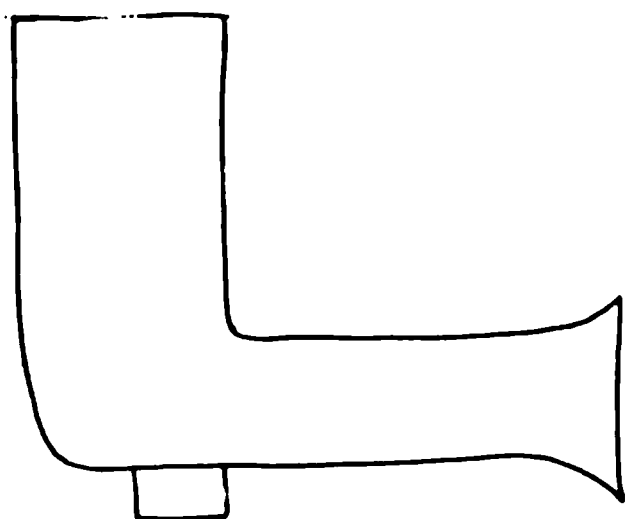


Fig. 102.

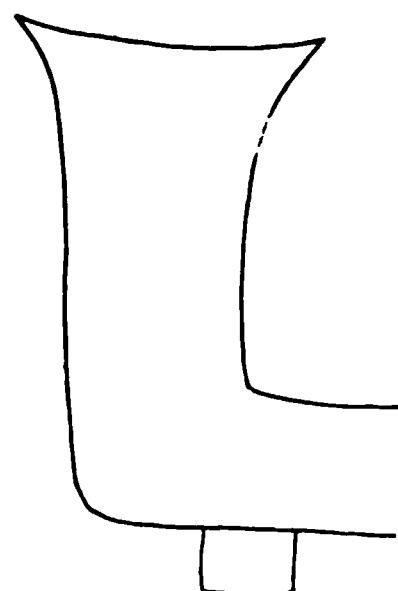


Fig. 103.

Fig. 102. Pipe made of Steatite used by the Thompson River Indians at Spences Bridge in 1895. About $\frac{1}{2}$ nat. size. (Drawn from a sketch by Mr. James Teit.)

Fig. 103. Form of the Flange-Shaped Mouth of the Bowl of some Thompson River Indian Pipes. About $\frac{1}{2}$ nat. size. (Drawn from a sketch by Mr. James Teit.)

Some tubular pipes are said to have had a flange around the mouth of the bowl, similar to that on elbow pipes as in Fig. 103; but this flange meets the body of the bowl with an even curve. Mr. Teit does not distinctly remember having seen such flanged tubular pipe bowls among the Thompson River Indians who gave him this information, but he saw one specimen at least, of the elbow type with flanged bowl. He further states that to his knowledge there is only one part of the country where the semi-transparent green steatite is obtained; that is, on the west side of the Fraser River,

¹ Smith, (h), Fig. 4.

over twenty miles north of Lytton, which as is well known is at the mouth of the Thompson River. This stone, when polished and used, takes on a much darker hue than its original color. The fire may be seen through the stone of the pipes when smoked in the dark. The bluish gray steatite is the most commonly employed and it turns black when polished and used. The Thompson River Indians can usually tell from what part of the country the stone comes of which any particular pipe is made.

The tubular form of pipe is remembered by the old Indians to have been in use in the Thompson River region, although not so common as the simple pipe bowls and elbow pipes, and one was seen in use in eastern Washington as late as 1896.¹ On the other hand, no simple pipe bowls known to be such, or elbow pipes have been seen among archaeological finds. The bowl and elbow pipes are affiliated with forms found farther east. This fact suggests that the tubular pipe was supplanted recently by bowl and elbow forms brought in from the southeast, or at least from the east. The westward movement of tribes due to the encroachment of our settlements may have brought them, or some of them, and they may be patterned after pipes seen in the hands of fur traders and their Indian employees. The tubular pipe made of steatite, shown in Fig. 104, was purchased from Mr. W. Z. York of Old Yakima (Old Town), who secured it from Shaw-wa-way, an Indian known as "Young Chief Aleck," who lives on a ranch three miles south of Old Yakima. This Indian is known to have frequently visited the Okanogon region and it is possible that he secured the pipe, decorated as it is, or got the idea for this particular sort of decoration from that region. This is suggested by the fact that this particular kind of decoration is common, especially on more recent ornaments, in the Thompson River region, the people of which in turn frequently visited the Okanogon country. The bowl of the pipe is cut squarely across at the end where the outer edge has been rounded. It is of the typical shape of this form of pipes, and has been hollowed out by gouging contra-screw-wise. It meets the stem abruptly and the latter is slightly larger than the base of the bowl, so that it seems to be separated from it. The stem is very short and cylindrical and the end is cut squarely off; but it is bevelled on each side so that about one third of the end is left and the bevelled surfaces extend over half the length of the stem. This beveling may have been to form the mouthpiece; but it seems more likely that the pipe had a long stem similar to those found in the Thompson River region.² This seems to have been broken off obliquely near the bowl, then cut squarely across, and the other side bevelled to give bilateral symmetry because one of these bevelled surfaces appears as if it had been

¹ Telt. (a), p. 300.

² Smith, (d), Figs. 103, 104 and 111; (c), Figs. 374a, b.

broken and then only slightly smoothed; both of these surfaces and the square end of the stem seem to have been more recently cut than the rest of the pipe. These three surfaces seem less polished and as if they were made with a steel knife. The bore of the stem measures 5 mm. in diameter. A portion of the bowl is decorated by incised lines into which red paint has been daubed, suggesting that it was recently applied; while the design itself, which is further described on p. 131 under the section of art, is of figures which suggest that it was made lately. Possibly the pipe is old, but was recently broken and decorated with the incised design and paint.

The fragment of a sculptured tubular pipe made of steatite shown in Fig. 105 is apparently about half of the original object. It was found in an Indian grave about a quarter of a mile from the bank of the Yakima River at a point about nine miles above its mouth, in August 1902, by Mr. W. F. Sonderman of Kennewick. Mr. Sonderman's collection from the immediate vicinity contained glass beads, a metallic handle and buttons, as well as chipped points. As the contents of the three graves from which he obtained this collection, during the construction of an irrigation canal were mixed, it seems that this pipe may belong to the same period as that of the glass beads and other objects of European manufacture and consequently may be modern, although it may be an old specimen, deposited in a modern grave. The general form of the pipe was thought to be that of a cone. The portion towards the front of the carving, however, is somewhat longer than that towards the rear, and the back is nearly flat, although this may be caused simply by the carving. The bore is somewhat smaller at the mouth of the bowl than lower down. It was apparently gouged out. Some traces of dirt, perhaps the remains of the material smoked in the pipe may be seen towards its larger opening. The carving, which represents a human form, is further described under the section of art on p. 135. As the tubular form of pipe seems to be common to this region, as well as to the Thompson River region, further north, it would seem that this specimen may be a variation from the type or merely one of these pipes made by an artist. It may be that such sculptured forms of this type of pipe may not be found in the Thompson River region, and that the carving of tubular pipes in this way may be characteristic of the Yakima region, although the style of art suggests that found in the Thompson River region and more especially in the Lillooet Valley.

Only one specimen of the second or simple bowl type was seen by us in the whole region. It is shown in Fig. 106, and was found near the head of Priest Rapids by a boy from whom Mrs. J. B. Davidson obtained it for her collection. She afterwards presented it to our expedition. It is made of schistose rock, apparently limestone, of gray color with lighter veins. The

object is oval in section, slightly longer than it is wide, and a little wider than it is thick being 32 mm. long, 29 mm. wide, and 15 mm. thick. If slightly flatter, this pipe would resemble in shape the third type. The inside of the bowl which was apparently gouged out, is 13 mm. in diameter; while the opening for the stem seems to have been drilled. This opening is 7 mm. in diameter. The rim of the bowl is flattened, and this flat surface re-

Fig. 104.

Fig. 105.

Fig. 108.

Fig. 106.

Fig. 109.

Fig. 104 (202-8122). Tubular Pipe made of Steatite. From an Indian living three miles south of Old Yakima $\frac{1}{2}$ nat. size. (Collected by Mr York.)

Fig. 105 (202-8120). Fragment of a Sculptured Tubular Pipe made of Steatite. From near Kennewick. $\frac{1}{2}$ nat. size. (Collected by Mr. W. F. Sonderman.)

Fig. 106 (202-8396). Pipe made of Limestone. From near the head of Priest Rapids. $\frac{1}{2}$ nat. size. (Collected and presented by Mrs. J. B. Davidson.)

Fig. 107 (20-0-1470). Pipe made of Sandstone. From the Snake River Indians. $\frac{1}{2}$ nat. size. (Collected and presented by Mr. Owen.)

Fig. 108. Pipe made of Blue Stone. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original in the collection of Mr. Janeck.)

Fig. 109. Pipe made of Stone. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original catalogue No. 155 in the collection of Mr. Janeck.)

sembles that of the part of a hammerstone used for pecking. This style of pipe somewhat resembles some of the pipes used by the Thompson River Indians of the present day and together with elbow pipes, supplemented the tubular pipe in that region. This suggests them to be more modern than the tubular pipes in this region where also they are not as numerous. The type is not found among the archaeological remains in the Thompson region,

but Mr. Teit sent one simple bowl pipe to the Museum from a very old grave at Spuzzum besides two from the Thompson Indians.¹ The absence of this form of pipe among archaeological specimens from the areas to the north and west suggests that the culture of this region is somewhat more closely related to that further east than are the cultures of the areas further north and west. The pipe is ornamented with a circle and dot design again mentioned under the section of art on p. 13.²

Specimens of the third or disk-shaped type are shown in Figs. 107, 108 and 109. The first, made of sandstone, is from the Snake River Indians, was a part of Mr. D. W. Owen's collection, and was presented by him to our expedition. It is nearly of the form of a disk but has slightly bulging sides, 52 mm. long, 49 mm. wide, and 19 mm. thick. The mouth of the bowl is 13 mm. in diameter; while the opening for the stem, at right angles to it, is 9 mm. in diameter. The convex appearance of the sides or ends of the disk is due to the beveling of these surfaces near their edges. On each of these sides is an incised design. These are again mentioned under the section of art on p. 125. The second specimen, shown in Fig. 108, is oval in outline with slightly convex sides. The object is made of blue stone and was found in the Yakima Valley. It is about 52 mm. long, 41 mm. wide, and 19 mm. thick. Parallel scratches on the surface suggest that it was brought into shape by grinding with a piece of sandstone, although these marks may be interpreted as those made with a file. The opening in the bowl tapers evenly towards its base, from one of the longer edges of the discoid; while the somewhat longer drilling for the stem from one of the shorter edges of the disk, at right angles to the bore of the bowl, is of nearly the same diameter throughout. The specimen is in the collection of Mr. Louis O. Janeck of North Yakima.³ The third specimen of this type which is shown in Fig. 109 is No. 155 in the collection of Mr. Janeck, and was also found in the Yakima Valley. It is made of stone resembling quartzite in appearance and is of a waxy, yellowish brown color. It is nearly circular in outline, almost flat on the rim, and the sides are somewhat convex. It is 45 mm. long by 40 mm. wide and 19 mm. thick. The bore of the bowl is 16 mm. in diameter at the mouth, and is somewhat larger than that of the stem, which is 10 mm. in diameter at its end, and at right angles to the bowl. Each bore tapers from its outer opening to the point of juncture. In the Nez Perce region to the east near Asotin city, this disk-shaped type of pipe is found.⁴ Mr. Fay Cooper Cole of the Field Museum of Natural History

¹ Teit, (a), Figs. 275 and 276.

² Museum negative no. 44505, 6-6.

³ Museum negative no. 44503, 6-4.

⁴ Spinden. p. 189, Fig. 6, Plate ix.

believes the Tlingit have a variation of this type of pipe and that it is also found in California. Its occurrence in Oregon is mentioned by Moorehead.¹

The fourth or rectangular bowl type is shown in Figs. 110, 111 and 112. The first shows the axis of the bowl and that of the stem, at nearly, if not exactly, a right angle. The specimen is in the collection of Mr. York, and is made of soft grit or sandstone. The outer opening of the bowl is somewhat larger than that of the stem. There was a band around the bowl, made up of a single thickness of thread which is not shown in the figure.

The second of these specimens, shown in Fig. 111, is a simple elbow pipe with the angle between the axis of the bowl and the stem, slightly greater than 90 degrees. It is also in the collection of Mr. York and is made of steatite, which he calls Wenatchee pipe stone. The outer opening of the bowl is slightly larger than that of the stem. The third specimen, shown in

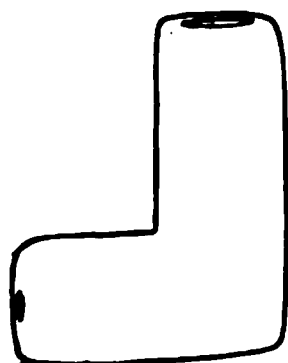


Fig. 110.

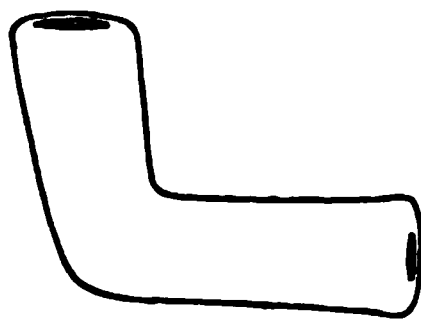


Fig. 111.

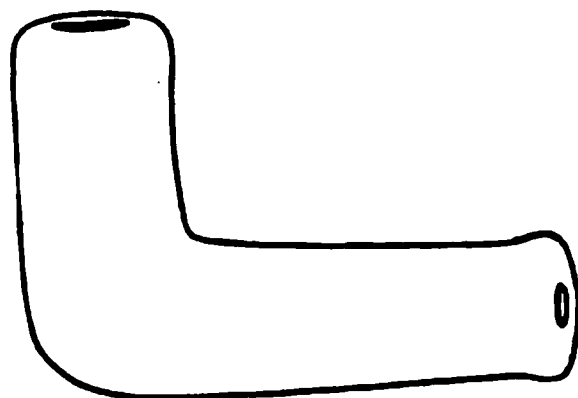


Fig. 112.

Fig. 110. Pipe made of Soft Sandstone. Locality Unknown. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. York.)

Fig. 111. Pipe made of Steatite. Locality Unknown. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. York.)

Fig. 112. Pipe made of Soft Sandstone. Locality Unknown. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. York.)

Fig. 112, is also of the simple elbow type and the axis of the bowl is nearly at right angles to that of the stem. It is in the collection of Mr. York, and is made of soft grit or sandstone of a yellowish gray color. In the Thompson River region to the north, according to Mr. Teit, there seems to be little doubt but that the tubular pipe has been supplanted by the simple bowl and elbow types.² This change may have been brought about by the copying of the early trader's pipes but Mr. Teit believes it more likely to have come from influence from the southeast, passed from tribe to tribe about the same time as the advent of the horse or a little later. The Thompson River Indians tell him that the tubular pipe continued to be the one in common use as long as native tobacco only was used, but after the introduction of manufactured tobacco the elbow type came to be exclusively used because very

¹ Moorehead, Fig. 27, p. 316.

² Teit, (a), Figs. 271 and 306.

much better adapted for holding the latter kind of tobacco. In the Nez Perce region to the east, pipes with rectangular bowls were found.¹ One of these bowls has an incised design representing a tomahawk, which with the character of other incisions on it suggest that it is modern. Only two finds of elbow pipes have been reported on the coast. These,² which were of fragments, were said by Mr. Edmond Croft to have been found by him in a shell heap near Markham on Grey's Harbor, Washington. They are made of fine-grained sandstone of a gray color. Both were apparently intended to be used with a wooden stem and one of them has a ventral mid-rib from the mouth of the stem nearly to the base of the bowl which reminds one somewhat of a similar appendage on the pipe from the Yakima Valley shown in Fig. 113 and one from the Thompson Indians.³ My supposition has been that they reached the coast recently from this general region possibly by way of the Columbia or were taken there by employees of the fur companies in early historic times.

The fifth type is illustrated by the specimen shown in Fig. 128. It is the only specimen of this type which I have seen from the region. It is now in the collection of Mrs. Jay Lynch at Fort Simcoe who obtained it from Chief Moses. It is made of black steatite which Mrs. Lynch calls Wenatchee pipe stone, inlaid with white metal and has a wooden stem. It is comparatively modern as is shown by the presence of inlaid white metal. The mouth of the bowl is 18 mm. in diameter, but tapers suddenly, the rest of the bowl cavity being nearly cylindrical. The opening for the wooden stem is 11 mm. in diameter, and also tapers suddenly to a nearly even bore. It is of the same form as many of the pipes made of red pipe stone (catlinite). This form of pipe is found throughout the Minnesota-Dakota region. This specimen, however, bears four carvings, which together with the inlaid white metal design are further mentioned under the section of art on pp. 118 and 135. It would seem that this type of pipe belongs to the region further east, and as no ancient pipe of this form has been found in this whole region, as well as from the fact that this specimen marks the most westerly occurrence of this form, so far as we know, we may conclude that it was introduced from the east in comparatively modern times. The type of carving, however, may be of more local origin. The bringing together of several animal forms may be associated with the idea of the totem poles found to the west; but no more so than the wooden pipe stems of the Plains which the general character of the carving more closely resembles.⁴ In this connection, it may

¹ Spinden, p. 188, Figs. 7 and 8, Plate ix.

² Smith, (b), Fig. 140.

³ Telt, (a), Fig. 306.

⁴ Museum negative no. 44508, 6-9, 6-10, 6-11.

be well to remember that in the Nez Perce region, catlinite for pipes seems to have been acquired from the Plains tribes.¹ A pipe made from stone found in the Cascade Mountains of Washington, is in the collection of Mr. C. G. Ridout, of Chelan, Washington, who states that it has a representation of a bear and a man on the shaft back of the bowl.

A specimen of the sixth type is shown in Fig. 113. It is the only one of this style which I have seen in the whole region, and was obtained from a Yakima Indian. It is in the collection of Mr. McCandless. It is made of steatite, which Mr. McCandless calls "sandstone from the northern part of

Wenatchee Lake." The form of the pipe seems to be a conventionalized tomahawk pipe. The bowl is circular in section and somewhat urn-shaped and rests upon the part that is drilled for the stem and which is rather square in cross section with slightly convex sides. Projecting from the lower part of this is the form which represents the tomahawk blade. It is wider at its convex edges than where it joins the base of the stem part. Its three edges are flat, and it is of about equal thickness throughout. The pipe is somewhat stained by tobacco. It seems likely that this was modelled after the metal hatchet, tomahawk or tomahawk pipe, introduced by the traders,² being a rather modern pipe, since such objects do not seem to have been used in early times in the great plateau region according to Lewis.³

Fig. 113. Pipe made of Steatite. From a Yakima Indian. $\frac{1}{4}$ nat. size. (Drawn from photograph 44506, 6-7. Original in the collection of Mr. McCandless.)

The seventh type is illustrated in Fig. 127. The specimen is the only one of the style which I have seen from this whole region and so closely resembles in its carving the work of the Kwakiutl, Haida and Tsimshian Indians of the coast to the northwest, that I am inclined to believe it was brought in as a gift or by trade. The material is apparently soft slate, but is rather light in color, possibly having been burned. Its appearance suggests that it is the same as that used by the Haida Indians on the Queen Charlotte Islands, for the carving of such things as dishes, miniature totem poles, and pipes. The pipe is made up of carvings representing among other things a bird, a human form and a human face, which are more fully described under the section of art on p. 136. This specimen was found two feet deep in earth at one side of a grave in a little hillside on Toppenish Creek, four miles southeast of Fort Simcoe. Above the earth were rocks, and the grave was marked by a circle of stones.

¹ Spinden, p. 188.

² Museum negative no. 44506, 6-7.

³ Lewis, p. 190.

In the grave were found elk teeth, and a sea shell, filled with a blue powder, evidently paint, and covered with what appears to be gut or a bladder-like skin. What is described as a silver coin, afterwards lost, was found with this pipe. It is possible that it may have been a silver disk or medal. The bowl of the pipe, which was gouged out, is in the middle of the carving, and the tube for the reception of the stem projects from the end under the human form. The upper part of the human figure is broken off. A hole was drilled in the opposite end of the pipe through the lower part of the bird form, but if it had any connection with the bowl, this is not now discernible.¹ The specimen shown in Fig. 59 and considered as a mat presser reminds one of an unfinished pipe.

ART.

The graphic and plastic art of the early people of this region is illustrated by pictographic line paintings in red and white on the basaltic columns of the cliffs;² petroglyphs of the same general style pecked into similar cliffs; incised designs on stone, bone, antler and dentalium shells, and carvings both incised and pecked in stone. Some of the objects found are colored by red ochre or have it rubbed into the lines of their incised designs. Examples of graphic art seem to be more common than those of plastic art.

The paintings and pecked designs on cliffs are more or less geometric although pictographic in character. The incised designs are still more geometric and include the circle and dot commonly found in the Thompson River region.³ This design is also common on modern objects from the coast of British Columbia and Washington, but was not there present among archaeological finds. Lewis⁴ states that according to the early writers, in the general area of which this is a part, porcupine quills were much used for decorating articles of clothing and that later, beads were used for this purpose. The modern designs are largely floral. Among the Nez Perce, floral and plant designs in beadwork are particularly common although some geometric designs occur, as on belts, the decoration of which is largely geometric, as squares, triangles and similar figures.⁵ Lewis⁶ believes that

¹ Museum negative no. 44509, 6-9, 6-10, 6-11.

² A few of which were figured and described in Smith, (g), pp. 195-203, and abstracted in *The Scientific American Supplement*, pp. 23876-8, Vol. LVIII, No. 1490, July 23, 1904, and in *Records of the Past*, pp. 119-127, Vol. IV, Part IV, April, 1905.

³ Smith, (c), Figs. 360b and 378; (d), Figs. 109, 110 and 114.

⁴ Lewis, p. 191.

⁵ Spinden, p. 236.

⁶ Lewis, p. 191.

the designs of the general region were originally geometric and that some of the modern geometric designs are survivals, while others suggest eastern influence. He further states that floral designs are found among the Salish tribes but to a much less extent. We found no floral designs among the archaeological specimens in the Yakima area. Some of the incised work, on certain of the carvings is of good technique, and artistic execution. This is noticeable in the object made of antler, carved on one surface to represent a human figure in costume, shown in Fig. 121 and on the dish shown in Fig. 116. Inlaying with white metal was practised in comparatively modern times. Animal heads are represented by the specialization of knobs on pestles, an animal form by a mortar and human forms by some of the pictographs, and petroglyphs, the incised antler figure and several of the pipes.

Many of the representations are realistic, others are highly conventional. Some conventional representations are explained by similar figures. For instance, the radiating lines of the pictographs shown in Plate XVI are probably explained satisfactorily by similar figures in Plate XI, Fig. 2, such radiations on the costumed figure in antler shown in Fig. 121 or by the feather headdresses worn by the present natives. Spinden states that in the Nez Perce region, realistic figures are probably of recent origin.¹ One of the carvings is clearly of the art of the northwest coast, from which the object or the artist who executed it must have come. Some of the pictographic-geometric and conventional figures probably represent guardian spirits and illustrate dreams done in symbols. A few art forms are evenly spaced on objects but only a few are distorted to fit the shape of the field. Pictographic symbols and conventional figures may be placed in groups to form designs as in the arrangement of the circles and dots on the pipe shown in Fig. 106.

In general, the art of the region tends toward line work of geometric and a slightly pictographic nature. It shows little resemblance to that of the coast, but a strong relationship to that of the Plains. The decorative art of the Nez Perce region includes motives from the Plains and also from the Pacific Coast.² Some of their designs partake strongly of motives from the Plains, while here in the Yakima Valley there are perhaps more examples of coast art and still much influence from the Plains. Spinden says that in early times the Nez Perce were very poor in decorative ideas and that the richness and variety found in their modern art may be ascribed to the absorbing of ideas from other cultures. This is perhaps equally true of the Yakima region where the influence of coast art in proportion to that from the Plains is perhaps greater than in the Nez Perce region.

¹ Spinden, p. 236.

² Spinden, p. 233.

Paintings. Pictographic line paintings somewhat geometric in character, made on the basaltic columns on the west of the mouth of Cowiche Creek, on the south side of the Naches River, about four miles northwest from North Yakima, are shown in Plates XIV–XVI. These pictures, some in red, and some in white, were probably painted with mineral matter mixed with grease. Their antiquity is unknown. In the Nez Perce region to the east,¹ pictographs in red, yellow and black occur, while in the Thompson River area² and in the Lillooet Valley,³ pictographs in red are found. Some of the Yakima pictographs have been destroyed during the construction of the irrigation flume which runs along the top of this cliff. Others are partly covered by the talus slope. All those remaining, are here represented by those reproduced in the plates. They extend from the top of the talus slope upward a distance of perhaps five feet. Many of them are indistinct, and appear more easily seen, if they are not actually clearer, in the photographs here reproduced than in the originals. Many of the paintings represent human heads and headdresses and one of them the whole figure with such a headdress. These headdresses may be compared to similar designs in the petroglyphs (Plate XI) at Sentinal Bluffs, thirty-three miles to the northeast (Fig. 2, Plate XII and Fig. 1, Plate XIII) at Selah Canon, eight miles to the northeast and the headdress pecked on the grooved net sinker shown in Fig. 14. Also, taken together with the pictographs representing the full figure with similar headdress shown in Fig. 1, Plate XIV, may be compared to the petroglyphs of men each with a headdress among those at Sentinal Bluffs, the human figure with a headdress carved in antler found near Tampico, only fourteen miles to the southwest and shown in Fig. 121, petroglyphs which apparently represent human forms somewhat similar to this, on Buffalo Rock, in the Nez Perce region to the east⁴ and the quill flattener carved to represent a human form with headdress or hair from the Dakota shown in Fig. 122.

The human figure with feather headdress indicated by ten lines shown in Fig. 1, Plate XIV is all in red. It is the next to the westernmost pictograph at this site. It is 457 mm. high, the ends of the legs are 279 mm. apart, the tip of the arms 254 mm., the width of the headdress 229 mm. and the height of the middle feather 101 mm. There are four horizontal red lines on the overhanging column above the figure.⁵ Fig. 2 Plate XIV shows

¹ Spinden, p. 232.

² Telt, (a), p. 339 and 381.

³ Telt, (b), Pl. ix.

⁴ Spinden, Plate x, Fig. 5.

⁵ Museum negative no. 44479, 4–4 taken from the east. First reproduced in Smith, (g), Fig. 2, Plate VIII.

human heads with feather headdresses in white.¹ Fig. 1 Plate xv shows similar human heads with feather headdresses also in white.² Fig. 2, Plate xv shows human heads with feather headdresses in white and a double star figure in white and red.³ Plate xvi⁴ shows human heads with feather headdresses in white and red. In addition, Fig. 2 shows the advertisement of a modern business man over the pictographs. Some of the pictographs at the same place have every alternate radiating line in red, while others are in white.

Mr. G. R. Shafer informed me that he knows of painted rocks in the Teton River Valley, 20 miles above the Nelson Bridge, which crosses the Naches a short distance above the mouth of Cowiche Creek. Mr. W. H. Wilcox of North Yakima stated to me that there are pictures on rocks on the west side of the Columbia River ten miles south of Wenatchee. Bancroft⁵ refers to painted and "carved" pictures on the perpendicular rocks between Yakima and Piquouse. According to Mallery, "Capt. Charles Bendire, U. S. Army, states in a letter that Col. Henry C. Merriam, U. S. Army, discovered pictographs on a perpendicular cliff of granite at the lower end of Lake Chelan, lat. 48° N., near old Fort O'Kinakane, on the upper Columbia River. The etchings appear to have been made at widely different periods, and are evidently quite old. Those which appeared the earliest were from twenty-five to thirty feet above the present water level. Those appearing more recent are about ten feet above water level. The figures are in black and red colors, representing Indians with bows and arrows, elk, deer, bear, beaver, and fish. There are four or five rows of these figures, and quite a number in each row. The present native inhabitants know nothing whatever regarding the history of these paintings."⁶ Apparently only paintings are meant.

Red ochre is rubbed in the circle and dot designs and the grain of the stone of the pestle shown in Fig. 30 and also in the incised lines on the pipe shown in Fig. 104. Red paint (mercury) partly fills some of the holes and lines on the pendant made of steatite shown in Fig. 119. Because of the mineral nature of this paint, it may have remained a long time and its presence does not necessarily prove that the supposedly old grave in which the object was found is recent. Red paint also fills the circles and dots in the slate object shown in Fig. 120 while vermilion paint is found in the grooves

¹ Museum negative no. 44483, 4-8 from the north. First reproduced *Ibid.*, Fig. 1, Plate VIII.

² Museum negative no. 44485, 4-10 from the north.

³ Museum negative no. 44480, 4-5 from the north.

⁴ Museum negatives nos 44486, 4-11, 44487 4-12 from the north.

⁵ Bancroft, IV, p. 735; Lord, II, pp. 102 and 260; Gibbs, I, p. 411.

⁶ Mallery, p. 26.

of the animal form shown in Fig. 125 and as this is probably a mineral which would be rather enduring, it does not indicate that the painting was recently done.

Painting was done on moccasins in the general plateau area of which this is a part.¹ Spinden states that in the Nez Perce region the natives depended upon minerals for dyes, except in the cases of a wood, which produced a brown dye, and rock slime which produced green² and that white, red, blue and yellow earth paints were obtained by them further east from the vicinity of the Grande Ronde Valley;³ also, that rock surfaces were painted over with brown as a field upon which to peck petroglyphs.⁴ In the same region moreover, white clay⁵ was used for cleaning clothing.

Petroglyphs. The petroglyphs pecked into the weathered surface of the basaltic columns found in this region, are similar in style to the paintings, being largely line designs of geometric or conventional representation together with a few realistic figures. The pictures are formed by pecking away the weathered surface and exposing the lighter color of the basalt below. Some of them may be very old, but the bruised surfaces making up the lines are not weathered very much in comparison with the surrounding rock surface and yet there is no history of their manufacture. In the Nez Perce region⁶ such pecked pictographs are also found, some of them being upon fields painted brown.

In Plate XI are shown petroglyphs on the vertical basaltic columns on the eastern side of the Columbia River at Sentinel Bluffs, immediately above Priest Rapids. They are at the base of the cliffs shown in Plate V. Those shown in Fig. 1 are to the east of the road which runs along a notch blasted in the top of the columns that rise from the river at this point, while those shown in Fig. 2 are about fifteen feet to the southwest on the columns that rise sheer from the river.

Some of those shown in Fig. 1⁷ represent human figures each with a feather headdress which may be compared with that of the antler figure found at Tampico (Fig. 121) and the pictographs of Cowiche Creek. This place is only about 47 miles northeast from Tampico, and 33 miles in the same direction from the mouth of Cowiche Creek. One of these is shown in Fig. 2.⁸ The long form in the centre has a headdress which taken with

¹ Lewis, p. 190.

² Spinden, p. 191.

³ *Ibid.*, p. 222.

⁴ *Ibid.*, p. 231.

⁵ *Ibid.*, p. 216.

⁶ Spinden, p. 232.

⁷ First reproduced, Smith, (g), Fig. 2, Plate IX; negative no. 44534, 8-11, taken from the west.

⁸ *Ibid.*, Fig. 1; Negative no. 44533, 8-10 as viewed from the north.

its shape reminds us especially of the human form in antler from Tampico. The general shape of the body and the row of dots on each side edge suggest a resemblance to the quill flattener made of antler from the Dakota shown in Fig. 122. On each side are human heads, each with a similar feather headdress that might be interpreted as rising suns with eyes and mouths. On the left are some similar figures without eyes and mouths. Below, is a horizontal figure resembling five links of a chain. There is also a goat which resembles the two pecked in a granite boulder near Buffalo Rock in the Nez Perce area, eighteen miles above Lewiston on the east bank of the Snake River.¹ The star at the bottom, the rays of which end in dots, a small oval with radiating lines at the left, and two connected ovals with radiating lines at the top, remind us of the stars at Selah Canon, shown in Fig. 1, Plate XII, the petroglyphs near Wallula Junction, shown in Fig. 2, Plate XIII, somewhat similar figures on the large petroglyph at Nanaimo² and perhaps even more than of the Nanaimo figures, those in the petroglyphs beyond Nanaimo at Yellow Island, near Comox.³ However, the two connected ovals with the radiating lines may represent hands of a human figure with a headdress having radiating feathers. All of these headdresses remind us of the others at this place shown in Fig. 1, the rising suns at Selah Canon next described, the pictographs at the mouth of Cowiche Creek, and the incised human form in antler.

In Plate XII and Fig. 1, Plate XIII are shown petroglyphs which appear fresher and whiter or yellower than the naturally weathered reddish basaltic columns into which they are pecked. They are on the north side of Selah Canon about one and a half miles from the Yakima River at a point about a mile north of Selah station or one half a mile south of the intake of the Moxee Canal. It is about twenty-five miles west southwest of Sentinal Bluffs, eight northeast from the mouth of Cowiche Creek and twenty-two miles northeast from Tampico. They are more easily made out from a distance than close by.

The petroglyph shown in Fig. 1, Plate XII, is the most northeasterly of the group. This seems to be made up of circles with a dot in the middle and radiating lines, some of which end in dots. They remind us of some of the same series of figures as the oval with radiating lines at Priest Rapids.⁴

The one shown in Fig. 2, is about eight feet to the southwest and a little lower down. The upper part of the left figure and the two main parts on

¹ Spinden, Fig. 4, Plate x.

² Smith, (b), Plate xi

³ *Ibid.*, Fig. 115.

⁴ Museum negative no. 44463, 2-12 from the east and from a greater distance, showing its relation to the next in negative catalogue no. 44462, 2-11.

the right, each consisting of a curve with short radiating lines like a representation of the rising sun, may be compared with the top of the petroglyph on the rocks a few feet to the southwest shown in Fig. 1, Plate XIII, next described, and with some of those at Sentinal Bluffs, shown in Plate XI; also, with the pictographs at the mouth of Cowiche Creek.¹

The petroglyph shown in Fig. 1, Plate XIII, is a few feet southwest of those shown in Plate XII, taken from the south. The segment with radiating lines like the rising sun at the top reminds us of similar figures among the other petroglyphs here just described, those at Sentinal Bluffs and pictographs at the mouth of Cowiche Creek, but the other lines are not interpreted and are not suggestive to us of other figures in the neighborhood. A small figure, similar in that it consists of two nearly vertical lines crossing each other and topped by a curved line, shows very faintly above, a little to the right.² A design similar to the part of some of these pictures interpreted as representing a headdress was also found pecked in the surface of the grooved net sinker shown in Fig. 14.

The petroglyph shown in Fig. 2, Plate XIII, is pecked on the top of a rock which projects about three feet from the surface of the ground near mile post 209 between it and 210 above the Spokane branch of the O. R. & N. on the south side of the Columbia River about four miles west of Wallula Junction and is here illustrated as one twentieth of the natural size, from a tracing made by Mr. J. P. Newell, of Portland, assistant chief engineer on that road. We are indebted to Mr. W. E. Elliott of New York City, formerly engineer with Mr. Newell for permission to copy this tracing.³ The top of the rock forms an east and west ridge. The pecked grooves are all of about equal depth and there are no other petroglyphs on the rock. The large figure at the left reminds us of the dog-like figures with "spines" in the petroglyphs at Nanaimo,⁴ on Vancouver Island, especially as it has waved parallel lines, a fin or "spine" and two concentric curves at the top similar in shape to the lines indicating the back of the head and the mouth of the Nanaimo figure. This is less suggestive of certain harpoon points that are incised apparently to represent fish found in the main shell heap in the Fraser Delta at Eburne⁵ although Eburne is nearer than Nanaimo and en route, and although these harpoon points have parallel lines, a fin-like projection and two lines representative of the back of the head or cheek and

¹ Represented in Museum, with the one shown in Fig. 1, by negative no. 44462, 2-11 and from a nearer point as shown in this figure in negative no. 44476, 4-1.

² Museum negative no. 44477, 4-2, is also represented from a greater distance in negative no. 44478, 4-3.

³ Museum negative no. 45696.

⁴ Smith, (b), Fig. 117a and Plate XI.

⁵ Smith, (a), Fig. 52.

the mouth. The small circles some with lines radiating from them, remind us of similar marks on the same large petroglyph at Nanaimo and even more so of the petroglyphs beyond Nanaimo at Yellow Island near Comox.¹ The large figure on the right reminds us of the human form of the petroglyph at Nanaimo.²

I am informed by Mr. Owen that there is a petroglyph on the north side of the Columbia River below Kennewick and that it has been destroyed by recent railroad construction; by Mr. W. H. Willcox of North Yakima that there are petroglyphs or pictographs on the rocks ten miles south of Wenatchee on the western side of the Columbia River; and by Prof. Mark Harrington that it is said that there are "engravings" on the cliffs overhanging Lake Chelan. Mallery³ refers to etchings at the lower end of Lake Chelan but his information seems to refer to painted figures only (See p. 120). The late Prof. Israel C. Russell informed me that there are etchings close to the river on both sides in the Snake Canon at Buffalo Rock in the extreme southeast corner of the state of Washington.⁴

Incised Designs. Among the designs incised on stone, attention may be called to the top of the pestle made of steatite shown in Fig. 35, which bears two parallel longitudinal incisions and notches, ten on the left and eleven on the right of each side edge of the obverse. There are fifteen fine incisions running obliquely down from the notches on the left to the first longitudinal incision. They begin at the eighth notch from the bottom and extend to the lower notch. On the reverse are three longitudinal incisions apparently more recently made, and eleven notches on each side edge. This incised knob is said by the Indians to represent the head of a snake. On the reverse of the steatite object, possibly a mat-presser, shown in Fig. 59a, is an incised pictographic sketch which unfortunately, with the exception of the nine short lines above, was re-scratched by its owner. It is reproduced in Fig. 59b. The first figure beginning at the left possibly represents a tree. The middle figure has not been identified but it is clear that the one on the right represents a human being. On the left of the groove in the object are incised two hands pointing towards the left. These also were re-cut and are not reproduced in Fig. 59. The incision in the edge of the top of the club shown in Fig. 62 and the incisions at right angles to this were probably intended for decorative purposes. There is an incised design on the rounded surface of the saddle-shaped hollow of the club shown in Fig. 64. This design is made of transverse notches above and a zigzag line below.

¹ Smith, (b), Fig. 115.

² *Ibid.*, Fig. 117a.

³ Mallery, p. 26.

⁴ Cf. Spinden, Figs. 4 and 5, Plate x.

The upper part of the right edge of this knob is flat with two incisions across it. Incised lines arranged parallel to each other in rows may be seen on the handle and knob of the club shown in Fig. 68.

There are thirteen of these lines on either edge of the knob. The other incisions are arranged in four vertical rows on the handle. The lines on the top of the shell pendant shown in Fig. 88 may be merely the depths of the teeth rather than incisions artificially made, but in this case they may have been considered as decorative and the shell may even have been chosen because of these lines. There are nine incised lines on the bone tube shown in Fig. 98. These run around it in a spiral direction in such a way that the lower end of each line is on the opposite side from the upper end.

The three transverse incisions on the top of the steatite specimen shown in Fig. 99 may be for decorative purposes or merely as tallies as also the five small drilled pits arranged about equi-distant from each other around the top and the four similarly arranged near the bottom.

The oblique incised lines on the edge of the mouthpiece and on the ridge about the middle of the pipe shown in Fig. 100, which slant outward from left to right at an angle of about 45° and make the ridge at least suggest a twisted cord, were no doubt made for decorative purposes. Pictographic scratches may be seen on the disk-shaped stone pipe, shown in Fig. 107. Those on the reverse are shown in Fig. 115.

Those on the reverse are shown in Fig. 115. A simple geometric incised line decoration on wood may be seen on a fragment of a bow shown in Fig. 114. It will be remembered that parallel irregularly arranged cuneiform incisions decorated a fragment of a bow found in the Thompson River region.¹ The incised design on the stone dish previously mentioned on p. 38 and shown in Fig. 116 consists of two horizontal incisions running around the upper part of the dish a little below its middle and a zigzag line made up of twenty-five V-shaped marks which fills the space between the flat rim of this dish and the upper horizontal line.



Fig. 114 a (202-8159). Incised Design on a Fragment of a Wooden Bow. From grave No. 10 (5) in a rock-slide near the mouth of Naches River. $\frac{1}{2}$ nat. size. b Section of Fragment of Bow shown in a

¹ Smith, (c) p. 411.

Incised designs on dentalium shells are shown in Figs. 117 and 118. The first four were found under the skeleton in grave No. 25. This skeleton was of a child and was surrounded by a stone cyst buried in a dome of volcanic



Fig. 115. Incised Design on Bowl of Pipe shown in Fig. 107. $\frac{1}{2}$ nat. size.

ash near Tampico, as shown in Plate x. This lot contained two shells ornamented with designs of the type shown in *a*, but in the one not figured the diamond points met and formed a checker pattern. There were four of the type shown in *b*, one of the type shown in *c*, and two like the type shown in *d*. The specimens shown in Fig. 118 were found among broken and charred human bones of about twelve individuals in cremation circle No. 15 (10) on the terrace northwest of the mouth of the Naches River. While there was

only one specimen of the type shown in *a*, there were two of the type shown in *b*, and one like the four represented by Fig. 117*b*. Another cremation

Fig. 116. Incised Design on Stone Dish. From Priest Rapids. $\frac{1}{2}$ nat. size. (Drawn from photograph 44537, 9-3. Original in the collection of Mrs. Hinman.)

circle containing incised dentalium shells is known as No. 18 (13) and was located on the same terrace. The specimens are mere fragments, one of

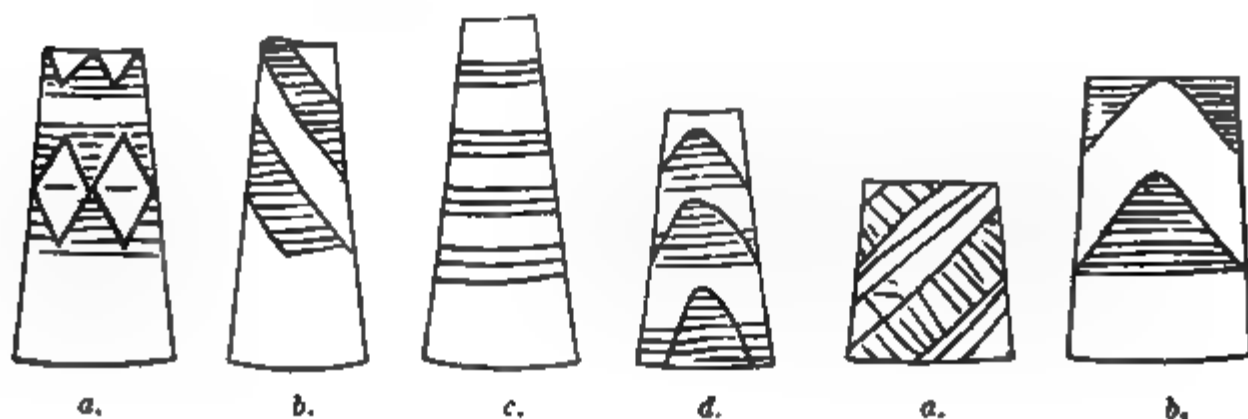


Fig. 117.

Fig. 118.

Fig. 117 (202-8193). Incised Designs on Dentalium Shells. From under the skeleton in grave No. 25 of a child in a stone cyst in dome of volcanic ash near Tampico. Nat. size.

Fig. 118 (202-8178). Incised Designs on Dentalium Shells. From among broken and charred human bones of about twelve individuals in cremation circle No. 15 (10) on terrace northwest of the junction of the Naches and Yakima Rivers.

them, from the tip of the shell, bears a design similar to that shown in Fig. 117b, the other bears a simple incised spiral, the space between one incision and another being about equal to the width of the incision itself. The character of both the technique and the motive of these designs resembles that of those found on similar shells at Kamloops in the Thompson River region ¹ and in the Nez Perce area to the east.² The design shown in Fig. 117a at least reminds us of paintings on the parfleches found among the modern Sahaptin and Plains tribes.

The incised design on the pendant made of steatite (p. 94, Fig. 119) does not seem to differ greatly in technique or motive from other incised designs found in this area and in the Thompson River region to the north.

Fig. 119. Incised Pendant made of Steatite with Red Paint (Mercury) in some of the Holes and Lines. From manubrium of adult male skeleton in grave covered with rocks on a low ridge about two and a half miles south of Fort Simcoe. Nat. size. (Original in the collection of Mrs. Lynch.)

While most of the lines and pits can be considered as forming symmetrical or geometric designs, the central figure on the side shown in Fig. 119b may be interpreted as a conventional representation of a life form, namely, a fish. Red paint is rubbed into some of the lines and pits.

The human figure described under costume (p. 100, Fig. 121) is a somewhat conventionalized realistic form indicated by incisions on one surface of a piece of antler 2 to 5 mm. thick.³ It was found in the grave of an infant under the vertebrae, No. 25 in a dome of volcanic ash. It is of good technique and artistic execution. The eyes are of the shape of a par-

¹ Smith, (c), Fig. 369.

² Spinden, p. 181 and Plate ix, Fig. 15.

³ First described and figured, Smith, (g). See also abstract in *Scientific American Supplement* pp. 23876-8, Vol. LVIII, No. 1490, July 23, 1904 and in *Records of the Past*, 1 c.; *The Saturday Evening Post*, Sept. 10, 1904 and the *Washington Magazine*.

allelogram with rounded corners. These, with similarly shaped figures on the headdress or inner hair-rolls, and on the hands, knees, and insteps, slightly resemble a motive common in the art of the coast to the northwest. The crescent-shaped mouth and thick lips are indicated by incised lines, while the cheeks are full, and the entire head is somewhat set out in relief from the rest of the object. The radiating figures above the head do not represent feathers in a realistic way, but closely resemble the conventional paintings made by the Dakota on buffalo robes. These paintings have been called sun symbols, but are interpreted by the Dakota as the feathers of a war-bonnet or other headdress. The fingers and thumb are set off from the palm by two lines, which, with the mark at the wrist, make a figure resembling the eye-form so common in Northwest coast art. The concentric design on the knees is probably related to the wheel, sun, or spider-web pattern common as a symbol on the shirts, blankets, and tents of some Plains tribes. The feet jutting out at the sides are slightly wider than the legs. The inside of the foot is straight with the inside of the leg, while the outer part is curved. The two, taken together with the lower portion of the legs, resemble a divided hoof. The divided hoof is a common design among Plains tribes.

There are only two specimens, of which I am aware, that resemble this. One (T-22107, 177 H) consists of seven fragments of a thin piece of antler found by Mrs. James Terry at Umatilla, Oregon, only about 83 miles in a southerly direction from Tampico. The back of this specimen is largely disintegrated, except on the two dog heads, and these being only about 5 mm. thick suggest that the whole figure was thin. The carving (Fig. 123) is in much greater relief than in the specimen from Tampico, although some of the lines are merely incisions. The tongue projects between, but not beyond, the lips. The cheeks are raised and there is considerable character to the face. The nose is aquiline and narrow, but the alæ are indicated. The orbits are sunken and horizontal oblong pits evidently indicate the eyes. The eyebrows are raised. Two horizontal incisions extend across the brow. Below the chin, at the left, are four incisions in a raised piece. This seems to represent a hand held with the fingers to the neck. A similar hand was probably at the right. A foot, with four toes in relief projecting above the brow as high as do the eyebrows, rests immediately above the upper horizontal incision and apparently indicates that some animal, possibly a bird, stood upon the human head. The fragment, however, is not sufficiently large to settle these points. Two of the other fragments are apparently intended to represent the heads of dogs. The eyes are indicated by the common circle and dot design; while the nostrils in one are represented by drilled dots. The shape of the heads is brought out by the carving of the

edge of the object. The fragments are broken off at the neck, and the lower side of each shows the finished surface of the back of the object. The remaining fragments show little or nothing. The animal heads and the feet and hands suggest the possibility that in some cases animal forms were combined in such figures, as on the Northwest Coast, although the general style of art of the object is like neither Haida nor Kwakiutl work, but more like the carvings of Puget Sound and the lower Columbia River. The fact that the carving of this face is more in relief helps to explain the intent of the author of the Tampico specimen.

The other specimen (50-3110 a, b, c) is a quill-flattener, made of antler (Fig. 122). It was obtained by Dr. Clark Wissler from the Dakota at Pine Ridge, South Dakota, who also made reference to other objects of the same sort among the tribe. Porcupine quills were flattened on it with the thumb nail until after it had been broken, when the lower or pointed end had been used as a brush in applying color to form designs on various articles made of buckskin. This end is stained a deep red and the point is much worn. The object, in general, resembles in shape and size the specimen from Tampico. Its sides are somewhat thinner and sharper. The slight indications of hair or headdress, the deeply cut eyes and mouth in the concave side, the holes or ears at the sides of the head, and the method of indicating the arms by slits, setting them off, from the body, are all details which emphasize this general resemblance. The technical work is about as good as that of the Tampico specimen, but the art work is inferior. One edge of the convex or outer surface of the bone has twenty-five notches, and in each tooth left between them, as well as above the top one, is a small drilled dot. Some of the notches on the other side are broken away with the arm, which is missing. On the same surface are twenty-six horizontal incisions, which were interpreted as year counts. The general shape of the body and the rows of dots are similar to those of the figure pecked on the cliff at Sentinel Bluffs (Plate XI, Fig. 2).

The Tampico specimen may have developed from a quill-flattener, which implement was probably of common and characteristic use among Indian mothers, not only of the Plains but also as far west as Tampico. If the result of such a development, it had probably lost its domestic use and become entirely symbolic.

Mr. Teit has heard the Thompson Indians speak of figures carved by some men in their spare time, and valued highly as curiosities and works of art. They had no practical value, and were generally used as ornaments inside the house. They were in wood, bark, stone and antler, more generally in the last three, and usually represented the human figure. Although the Indians aver that they were sometimes very elaborately and truthfully carved,

it is impossible to say, in the absence of a good specimen from the Thompson Indians whether there was any resemblance in style to that of this figure. The Thompson sometimes, placed such figures on the tops of houses, but the great majority were shown inside the houses. The Indian who made the one illustrated¹ told Mr. Teit that he had seen some of larger size which had taken a carver's spare time for many months.

The headdress seems to be a so-called war-bonnet, and would indicate that the figure was that of an important personage; perhaps a suggestion of what had been hoped for the child's position in the tribe or after death. The arms, body, legs, and feet are apparently bare and ornamented with ceremonial paintings, while about the waist is an apron. The whole object seems of a rather high order of art to be a mere child's doll, and it would seem more plausible to consider it as an emblematical figure. The general style of art and costume indicated show little or no resemblance to those of the Northwest Coast, but a strong relationship to those of the Plains.

There are some incised lines on the pipe shown in Fig. 127. Those on the pipe shown in Fig. 104 are described on p. 131. In the Nez Perce region, according to Spinden, incised designs, some of them of a pictographic character and probably modern are found on pipes, and designs of ladder shape are found on a flat plummet-shaped bone object.²

Notches. The notch in the base of the spatulate object made of bone shown in Fig. 58 and the two notches in each side of the base may be for practical purposes but were probably intended to be artistic, while the six notches in the edge of the pendant made of slate shown in Fig. 81 probably also have been intended for decoration or even to make the object represent something although possibly the representation may be rather conventional.

In the Nez Perce region to the east,³ a notched stone has been found near Asotin and notches occur as decorations on objects found in the Thompson River region to the north, but, of this type, they are rare if not absent among archaeological finds on the coast to the west from Fort Rupert on northern Vancouver Island to Tacoma.

Circle and Dot Designs. The circle and dot design is commonly found in this region. It may be seen on the top of the pestle shown in Fig. 30. There is one of these designs in the tip and eleven about equi-distant in a row around the edge of the knob. In the Nez Perce region to the east⁴ the design is found on bone gambling pieces. Further east, this design is also found. This motive may be seen around the top of the bowl on a pipe

¹ Teit, (a), p. 376, Fig. 297.

² Spinden, p. 188 and Plate VII, Fig. 31.

³ *Ibid.*, p. 183, Plate IX, Fig. 3.

⁴ Spinden, p. 252, Plate VII, Fig. 30.

(50-4867a, b) from the Gros Ventre Indians of Montana collected by Dr. Clark Wissler, which, however, is considered to be recent. To the west, it is not found among ancient things on the coast but among recent objects it may be seen on certain bone gambling cylinders and on beaver teeth used for dice. The design is common in the Thompson River region¹ and the Lillooet Valley between there and the coast.² It is perhaps even more frequently seen on the modern things among the Thompson River Indians³ who often visit the Okanogan country.

The pipe shown in Fig. 104 was secured from an Indian who is known to have frequently visited the Okanogan area so that if he did not bring the pipe from there, he may at least have gotten the idea for this style of decoration there. This suggests an explanation for the occurrence of the circle and dot design on what are apparently older specimens from the Yakima country. On the lower end of this specimen is a design made up of a zigzag line based upon an incision running around where the stem meets the bowl. The five triangles thus formed are nearly equilateral and there is a circle and dot design in each. Other circles and dots are arranged in seven equi-distant longitudinal pairs about the middle of the bowl. In addition, parallel to these, and between two of the pairs, there is a double-headed figure each end of which resembles the form of a crude fleur-de-lis. All of the incisions on this pipe are colored with red paint. The circle and dot design may be seen on the limestone pipe shown in Fig. 106. There is one circle and dot on the tip of the base, encircling this is a row of eight of them and outside of this still another circle of nine. Around the opening for the stem is a circle made up of eight, around the mouth of the bowl are ten and between the circle around the bowl and the one around the stem are three of the circles and dots. A typical circle and dot decoration is shown in Fig. 120 of what, as stated on p. 65, may possibly have been used as a whetstone. The object is made of slate and the top is broken off. It is 142 mm. long, 18 mm. wide and 6 mm. thick. The lower end and side edges are rounded. On the reverse, the design is similar except that it is continued upward by three circles and dots arranged in the same order as the uppermost three on the obverse and that there are several slightly incised marks on it, one of which, of X form, makes a tangent and a cord with the next to the lower circle and dot. All the circles and dots are filled with red paint. There are twelve incisions, possibly tally marks, on one side edge near the point. The original is in the collection of Mr. Janeck.⁴

¹ Smith, (c), Fig. 378; (d), Fig. 109.

² Teit, (b), Fig. 92.

³ Teit, (a), Figs. 118 and 210.

⁴ Museum negative no. 44503, 6-4.

The symmetrical arrangement of the perforations and the pits on both sides of the object shown in Fig. 77 was no doubt due to artistic motives.

Pecked Grooves. Some designs were made by pecking grooves in stone. Part of these, those forming petroglyphs, have been mentioned on p. 121 and are shown in Plates XI-XIII. The upper portion of the marking on the grooved stone shown in Fig. 14 is made in this way. It may represent a feather headdress, such as is mentioned on p. 119 and such as is so common in the pictographs as well as in the petroglyphs. The design on the lower part of the same object was formed in the same way and on the obverse of the net sinker shown in Fig. 15 are pecked grooves forming three concentric semi-circles on each side of the groove and nearly parallel with the edges of the object. Taken together, they give the suggestion of a spiral. There are three pecked grooves encircling the stone mortar shown in Fig. 20 and two around the head of the pestle shown in Fig. 25. On each side of the lower part of the pestle shown in Fig. 31 is a longitudinal design made up of four parallel zigzag pecked grooves. The two pecked grooves at right angles to each other on the specimen shown in Fig. 60 while they are probably made for use may have been interpreted as decorative or artistic. This may also be said of the three pecked grooves at right angles to each other on the club-head shown in Fig. 61, and it seems likely that the eight pecked pits made in the middle of the spaces between these grooves and possibly even the two pits at either pole of the object were intended to embellish it. Pecking was also the process employed in forming the sculpture shown in Fig. 125. The four pyramidal or dome-shaped nipples on the top of the knob of a pestle found at Five Mile Rapids mentioned on p. 45 were probably made by pecking, followed by polishing and they may have served a ceremonial as well as a decorative purpose.

Animal and Human Forms. There are a number of sculptures that apparently were intended to represent heads of animals, whole animals and human forms. The top of the pestle shown in Fig. 31 is sculptured to represent what is apparently an animal head. The top of the one shown in Fig. 33 has three nipples one of which is longer than the others. This sculpture also seems to represent an animal head, the ears being indicated by the short nipples and the nose by the long one. The top of the pestle shown in Fig. 34 apparently represents an animal head, the mouth being indicated by the groove, each eye by a pit and there are four incisions across the top or back of the head. A sculptured animal head, with wide open mouth, pits for eyes, and projections for ears on what may be a pestle top, has been found in the Nez Perce region to the east ¹ and pestles with heads

¹ Spinden, Plate ix, Fig. 19.

Fig. 122.

Fig. 121.



Fig. 123.

Fig. 120.

Fig. 120. Circle and Dot Design on Whetstone made of Slate. From the Yakima Valley. $\frac{1}{2}$ nat. size. (Drawn from photograph 44503, 6-4. Original in the collection of Mr. Janeck.)

Fig. 121 (202-8191) Costumed Human Figure made of Antler. From grave No. 25 of a child in dome of volcanic ash near Tampico. $\frac{1}{2}$ nat. size.

Fig. 122 (50-3110a, b, c). Quill-flattener made of Antler. From the Dakota at Pine Ridge, South Dakota. $\frac{1}{2}$ nat. size. (Collected by Dr. Clark Wissler.)

Fig. 123 (T-22107, H-177) Fragments of a Figure made of Antler. From Umatilla, Oregon. $\frac{1}{2}$ nat. size. (Collected by Mrs. James Terry.)

are found in the Thompson River area to the north.¹ The knob shown in Fig. 35 (p. 47) is interpreted as representing a snake's head. The heart-shaped knob on the top of the club shown in Fig. 68 resembles the



Fig. 124. Fragment of a Sculpture with Hoof-like part. From Pasco. $\frac{1}{2}$ nat. size. (Drawn from a sketch. Original in the collection of Mr. Owen.)

form of an animal head and stands at an angle of about 45° to the axis of the club. Two of the incised circles probably represent the eyes. The top of the handle of a digging stick made of horn of the Rocky Mountain sheep, shown in Fig. 126 is sculptured to represent an animal head. It was obtained from an Indian woman living near Union Gap below Old Yakima.

Fig. 124 illustrates a fragment of sculpture from Pasco. It is hoof-shaped and is here reproduced from a sketch of the original in the collection of Mr. Owen. The sculptured animal form made of lava shown in Fig. 125 which was mentioned on p. 38, bears a mortar or dish in its back. It is a good example of an art form which has been specialized so that it may be used or at least so that the useful part is less prominent than the animal figure. It has been sculptured by pecking.

Fig. 125. Sculptured Animal Form made of Lava. From an Indian who claimed to have found it in a grave on the Yakima Reservation two miles below Union Gap below Old Yakima. $\frac{1}{2}$ nat. size (Drawn from photographs 44452, 2-1, 44455, 2-4, and 44503, 6-4. Original catalogue No. 35 in the collection of Mr. Janeck.)

The raised eyes are almond-shaped rather than elliptical, and the ears are indicated by raised places on the transverse ridge at the top of the head. The mid-rib or dewlap under the chin is about 6 mm. wide and of the

¹ Smith, (c), Fig. 341a; Telt, (a), Fig. 295.

three transverse grooves in this, only the upper one is deep. The tail is slightly under cut. The grooves are all more or less colored with vermilion, apparently a mineral paint and consequently sufficiently lasting so that we need not consider even the painting as necessarily modern. The general form and especially the four elephantine legs remind us of a somewhat similar animal form with a dish in its back found in a shell heap in the delta of the Fraser River¹ and the animal form with the dish in its back resembles slightly carvings found in the Lillooet Valley² and the Thompson River region.

The pipe made of steatite shown in Fig. 128³ illustrates the modern type of carving in soft, easily cut stone, as well as the style of white metal inlaying employed here during recent years. In this case, the inlaying is nearly bilaterally symmetrical as may be seen by comparing Fig. 128a with the outlines in *c* and *d*. The carving is not symmetrical, the human form holding a fish-like form appearing on one side only, while the rear figure evidently represents a turtle which animal is found in the valley. The other two figures are not easily identified but the forward one perhaps represents a dog, the white metal inlay on it possibly representing a harness, but as likely was merely for decoration. The figure on the base of the pipe might represent a lizard or any quadruped with a long tail. This form and the way it is represented as clinging to the cylindrical part of the pipe at least remind us of similar forms seen on totem poles in the region from Puget Sound

to Victoria.⁴ The technique is rather crude and the style of art does not closely resemble that of the coast, but reminds us of certain sculptures found on pipes and on the carved wooden stems of pipes in the Plains where this particular shape of pipe is much more common than here.

In Fig. 105 is illustrated a fragment of a sculptured tubular pipe made from steatite by cutting or scratching and drilling the soft material rather than by pecking. It was apparently intended to represent an anthropoid form. The mouth is indicated by an incision, the other features of the head

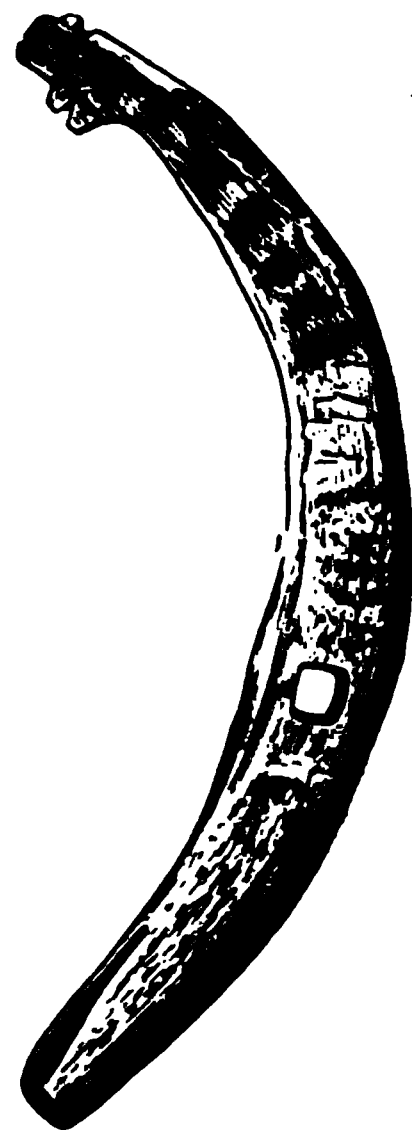


Fig. 126 (202-8121). Handle of Digging Stick made of Horn of Rocky Mountain Sheep. From an Indian woman living near Union Gap below Old Yakima. $\frac{1}{2}$ nat. size.

¹ Smith, (a), Fig. 56.

² Telt, (b), Fig. 97.

³ First figured on p. 283, *Archaeology of the Yakima Valley* by Harlan I. Smith, *Washington Magazine*, June, 1906.

⁴ Cf. also Smith, (b), Fig. 185a.

are more difficult to determine, but both the arm and the leg stand out in high relief. As previously suggested on p. 111, this style of art slightly resembles that found in the region from the Lillooet Valley to the Lower Willamette and as far east at least as The Dalles.¹ It is possible that some of the sculptures found in the Thompson River region² adjoining the Lillooet Valley on the east and the Yakima region on the north, may be somewhat related to the style of art of this fragmentary pipe. The human form shown in Fig. 121 has been discussed on p. 127 as it is incised rather than carved in the round. Clark mentions a "malet of stone curiously



Fig. 127. Pipe made of Stone. From a hillside grave on Toppenish Creek near Fort Simcoe. Collected by Mrs. Lynch. $\frac{1}{2}$ nat. size. (Now in the collection of Mr. George G. Heye, New York.)

carved,"³ which he says was used by the Indians near the mouth of the Snake River and Eells⁴ mentions two stone carvings from the general area of which this is a part which he describes as horses' heads. If this interpretation be correct, the carvings are evidently modern. The fish form shown in Fig. 119 has been mentioned on p. 127.

The very form of the pestle shown in Fig. 34 and the symmetrical outline of the club shown in Fig. 62 are in themselves somewhat artistic, while the fact that the pipe shown in Fig. 113 somewhat represents a tomahawk or hatchet suggests that it may have been sculptured as representative art.

It seems likely that it was modelled after the metal tomahawk pipe introduced by the traders which of course would indicate that it was recently made.

Coast Art. The pipe shown in Fig. 127 which was mentioned on p. 116 is clearly of the art of the northwest coast. It must have been brought to this region from as far at least, as the Kwakiutl and Haida region, and may be the work of an artist from that part of the coast, on Vancouver Island, north of Comox. Although in a fragmentary condition, this sculpture exhibits an excellent technique of its style of art. Astride of the stem is a

¹ Teit, (b), Figs. 68 and 95-97, Smith, (d), Fig. 183 and especially Figs. 195b and 198.

² Smith, (d), Fig. 113; (b), Fig. 185a.

³ Lewis and Clark, III, p. 124.

⁴ Eells, p. 293.

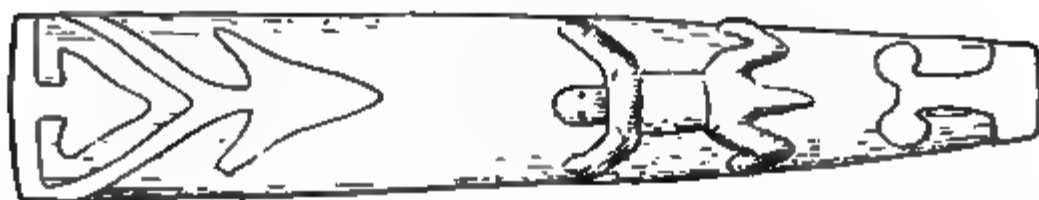
*a**c**d*

Fig. 128. Sculptured and Inlaid Pipe made of Steatite with Wooden Stem. From Chief **Moses** of the Yakima Region. $\frac{1}{4}$ nat. size. (Drawn from photograph 44508, 6-9, 6-10, 6-11. Original in the collection of Mrs. Lynch.)

human figure with the left hand to the chest, and the right one resting on the right knee. The head is missing, the chest muscular. The other end of the pipe apparently represents the thunder bird. The head and most of the figure are bilaterally symmetrical. The beak is cut off in such a manner as to form a flat surface at the tip. The feathers of the rear portion of the left wing extend in a different direction from those on the tip, while those of the right wing are parallel with those on the rear part of the left wing. The lower side or tail of this bird figure is broken off, but it probably extended to the broken place shown at the neck of the human face on the base of the pipe. In it, may be seen a groove, the half of a longitudinal perforation which does not connect with the pipe bowl. The carving on the right side of the pipe bowl, the top of which is broken away, is practically the same as that on the left, while the base is carved to represent a human head.

METHOD OF BURIAL.

In ancient times, there were three principal methods of disposing of the dead: in graves in domes of volcanic ash, in rock-slide graves, and in cremation circles. In all of these they were covered with stones.¹ Detailed descriptions of the graves explored by us, are given in the appendix. There are also burials covered with pebbles, some of which may be old; and recent graves (p. 20), where the bodies were apparently buried at length with the feet to the east, and both head and foot marked by a stake, the one at the head being the larger. Simple graves in the level ground known to be old were not found. Gibbs saw bodies wrapped in blankets and tied upright to tree trunks at some distance above the ground near the mouth of the Okanogan River.²

Burials in Domes of Volcanic Ash. In this arid region are stretches of country locally known as 'scab land,' on which are occasionally groups of low dome-shaped knolls from about fifty to one hundred feet in diameter, by three to six feet in height.³ These knolls consist of fine volcanic ash, and apparently have been left by the wind because held in place by roots of sage brush and other vegetation. This ashy material has been swept from the intervening surface leaving the 'scab land' paved with fragments of basalt imbedded in a hard soil. The prehistoric Indians of this region, have used many of these knolls, each as a site for a single grave (Fig. 2,

¹ Cf. also Yarrow, p. 178; Gibbs, (b), p. 201.

² Gibbs, (a), p. 413.

³ See Museum negative nos. 44442, 1-3, and 44496, 5-9.

Plate ix).¹ These graves, which are located in the tops of the knolls, are usually marked by large river pebbles, or, in some cases, by fragments of basalt that appear as a circular pavement projecting slightly above the surface of the soil. None of them are known to be recent. On the other hand, there is no positive evidence of their great antiquity. In these we sometimes find a box or cyst. This box (Plate x) was formed of thin slabs of basaltic rock some placed on edge and large flat slabs covering the cyst so formed. Above this, as was usually the case, above the skeletons in this kind of grave, the space was filled with irregular rocks or pebbles. The rocks and cyst were entirely different from those of the cairns of the coast of Washington and British Columbia.² The skeletons were found flexed, on the side. In the graves, artifacts such as dentalium shells were deposited at the time of burial.

The Kalapuya of the Willamette Valley to the southwest, buried their dead in the earth. One writer described the process as follows: — "When the grave was dug they placed slabs on the bottom and sides, and when they had lowered the wrapped body down, placed another over, resting on the side ones, and filled in the earth."³ The account does not seem to indicate whether these slabs were of wood or stone, but in either case there is a certain similarity to the graves with the stone cyst found near Tampico.

A grave which may be of this type, found about two and one half miles south of Fort Simcoe was reported to me by Mrs. Lynch who furnished the following information about it. It was on a low ridge with the usual cairn of rocks about three feet high covering it. This cairn was made up of two distinct layers of rocks, both lying above the contents of the grave which included the skeleton of an adult man estimated to be at least six feet tall and that of a child about six to eight years of age, according to identifications made by the physician of the United States Indian service stationed at Fort Simcoe. The man's skull which was well preserved though brittle, was found four feet below the ground or approximately seven feet below the top of the cairn and on the eastern side of the grave. The pelvis of the child was completely decayed, and few of the bones were intact except the maxilla which was found in the western part of the grave between the patellæ of the man. Near them were found four "links" [beads] of a copper necklace. The maxilla was deeply copper-stained. The steatite ornament shown in Fig. 119 was found on the man's manubrium.

Rock-slide Graves. The rock-slides on the hill and canon sides as in the

¹ See Museum negative no. 44497, 5-10, taken from the north of east. See also pp. 17 and 161. First mentioned in Smith, (g), VI.

² See Smith and Fowke.

³ Lewis, p. 178; Gatschet, p. 86; American Antiquarian, IV, 1882, p. 331.

region to the north had frequently been used as burial places. The graves are found from top to bottom. Some of them seem very old. Others were proven to be recent by the character of the objects found in them. The skeletons were in or on the ground and the rocks of the slide had been piled or caused to slide over them (Fig. 1, Plate VIII).¹ The skeleton was buried from one to five, six or even ten feet deep. In some cases, the rocks seemed to have sunk as the body decayed, in others they formed a pile as if placed there to mark the grave. Some graves were marked with sticks (Fig. 3, Plate VI). In others, probably always the older graves, sticks were not seen having doubtless decayed. One of the graves found rifled 75 feet above the little flat at the edge of the north side of the Naches River about a mile and a half above its mouth, seemed to be walled up with rocks like a well and slabs of a broken canoe, part of which had been thrown out surrounded a few of the disturbed bones. The skeletons were always in a flexed position (Fig. 2, Plate VIII) and objects were found to have been placed in some of these graves.

Spinden states that cemeteries are readily located by the heaps of "river-worn or rock-slide boulders" piled over the graves in the Nez Perce country.² They are usually on the first bench above the river bottom and are found near the traditional village sites, from which they can be seen. The more common method of disposing of the dead there, was by burial in the ground, especially on stony hillsides, and covering the graves with stones to keep off the wild animals. This seems to have been the prevailing method throughout the whole Columbia region of which this is a part.³ Rock-slide graves were sometimes made in basaltic cliffs in the Nez Perce region. One of these is known to have been used in recent times from the presence of a Lewis and Clark medal,⁴ and graves marked by pieces of upright cedar and covered by large piles of stone are reported by Spinden on the east bank of the Snake River, beside the mouth of the Grande Ronde.⁵

Indian graves filled up with stones are numerous in the vicinity of the several remains (pp. 29, 54 and 82) near Mr. Turner's home, according to Mr. J. S. Cotton. Mr. Turner told him that all the graves that had been excavated contained bones in a greatly decayed condition, which suggested to him that they were very old. These graves, like the other remains of the vicinity previously mentioned, have been in the same condition since about 1874.

¹ See Museum negative no. 44513, 7-3, from the south in base of rock-slide on the north side of the Yakima River about a mile below the mouth of the Naches River, see p. 15.

² Spinden, p. 181.

³ Lewis, p. 190; Lewis and Clark, IV, pp. 366-7, 371, V, p. 99; Ross, (a), pp. 320-321; Cox, p. 105; Douglas, p. 339; Gibbs, (a), p. 405.

⁴ Spinden, p. 181.

⁵ Spinden, pp. 181 and 252.

The terraces mentioned on p. 13 (Fig. 1, Plate VII)¹ may have been made to facilitate reaching rock-slide graves in the same slide; while the pits which were found in the slides (Fig. 2, Plate VII)² walled up on the outer sides like balconies, with the rocks that apparently came both from the pits and the disturbed slide above them, have been considered as rifled graves or graves from which the burials had been removed (p. 13).

The following quotation may refer to rock-slide pits:³ "In the eastern part of Marion County, Oregon, there stands an isolated and most strikingly regular and beautiful butte some three hundred feet in height and covering nearly a section of land. It was fringed about its base, at the time of which I write, with fir groves, but its sides and well rounded and spacious top were devoid of timber, except a few old and spreading oaks, and perhaps a half dozen gigantic firs, whose weighty limbs were drooping with age. A meridian section line passes over the middle of this butte, and four sections corner near its top. While running this line and establishing these corners in 1851, I observed many semi-circular walls of stone, each enclosing space enough for a comfortable seat, and as high as one's shoulders when in a sitting posture, upon cross-sticks as high as the knee . . . the older white residents said the Indians made them, but for what purpose they could not say. I became a witness to the use, and was particularly impressed with the fitness for what I saw. Indians from the North and South traveling that way generally camped upon the banks of the Abiqua Creek, a rapid stream of pure, cold water, just issued from the mountains upon the plain. The butte was near, and this they ascended and, taking seats within the stone sanctuaries, communed in silence with the Great Spirit. Bowing the head upon the hands and resting them upon the knees for a few moments, then sitting erect and gazing to the west over the enchanting valley interspersed with meadow, grove and stream." The author states that the place is now called Mount Angel, is surmounted by a Roman Catholic cathedral and that the Indians called this butte *Tap-a-lam-a-ho*, signifying Mount of Communion; and the plain to the west *Chek-ta*, meaning beautiful or enchanting.

Possibly the burials in the domes of volcanic ash and those in the rock-slides are practically the results of a common motive by the same people in the same time and the differences may be due simply to the difference in the character of the near by topography and the relative convenience of securing

¹ See Museum negative no. 44520, 7-10, from the southwest, about a mile above the mouth of the Naches River, (p. 13).

² See Museum negative no. 44519, 7-9. The same slide from the southwest (p. 13).

³ Pp. 35 and 36 of an article entitled "Extract from T. W. Davenport's, 'Recollections of an Indian agent (not yet published),' " *The Quarterly of the Oregon Historical Society*, March, 1904, Vol. V, No. 1.

the material to cover the graves. This idea is strengthened by information given me by Mr. W. H. Hindshaw who stated that from sixteen to thirty miles above the mouth of the Snake River where it cuts through canons there are rock burial heaps immediately above flood level and burials in the flood sand below, both of which he found to contain human bones and implements. He also stated that graves are found on the bluff overlooking the river. One was curbed with the remains of a cedar canoe. The grave had a bottom of plank and a cover over the body — that of a small child — which was wrapped in a fur, apparently a beaver skin. There were a number of beads and brass buttons and a large fragment of the shell of the *Schizothoerus nuttallii* which must have come from the coast.

Cremation Circles. Rings of stones (Fig. 1, Plate IX)¹ were also seen and on excavation within them cremated human remains were found usually several in each circle. In some cases the ring was irregular and in others assumed the form of a rectangle. None of them are known to be recent. In such places, dentalium shells, flat shell beads, and shell ornaments were usually seen. Mr. Teit says that rings of stones were also put on top of graves in the Thompson River region. Along the Columbia, below the mouth of the Snake River, vaults or burial houses like those found among the Upper Chinook were used.² A somewhat similar method was observed even among the Nez Perce.³ This suggests that the cremation circles here described, may be the caved-in remains of earth-covered burial lodges built somewhat on the plan of the semi-subterranean winter houses.

Position of the Body. In all the old graves the skeletons were flexed and usually on the side (Plate VIII, Fig. 2).⁴ The graves where the body was buried at length with the feet to the east were doubtless recent and probably placed that way due to the teachings of Christians. In the Nez Perce region to the east, the body was placed in a variety of positions, either flexed or at length⁵ and sometimes upon the side. Considering the difference between the costume and objects used by the men and those by the women, in the Nez Perce region to the east,⁶ it would seem that the contents of the graves in this near by region may be used to check the determination of the sex of the skeletons.

Property with the Dead. Objects are usually found with the remains of

¹ Museum negative no. 44493, 5-6 of circle no. 14 from the east on the terrace northwest of the junction of the Yakima and the Naches Rivers (p. 15 and 157). Cf. also Museum negative no. 44522, 7-2.

² Cf. Lewis, p. 190; Lewis and Clark, II, pp. 139-140.

³ Lewis and Clark, IV, p. 369; Lewis, p. 190.

⁴ Museum negative no. 44516, 7-6, see grave no. 22, p. 160.

⁵ Spinden, pp. 182 and 252.

⁶ Cf. Spinden, p. 216.

the dead in all classes of old burials but some of the graves contained nothing; others very little. There was apparently no radical difference in the character of the material in the graves in volcanic domes and those in the rock-slides; but the more modern rock-slide graves seemed, on the whole, to contain a greater number of objects than the older graves or the graves in domes. On the coast, objects are found with recent burials, but rarely in ancient graves. The cremation circles often contained dentalium shells and bits of shell objects but little else. In the Nez Perce region to the east a considerable amount of property, ornaments and utensils is found buried with the dead.¹

Horse Sacrifices. We discovered no graves containing horse bones or over which a skeleton of a horse was found, although it will be remembered that such were found in the Nez Perce region east of here.² There, the killing of horses over the graves of their owners became the usual practice when horses were plentiful. Sometimes a horse was buried over the body.³ In this region, however, we found no evidences of the horse in connection with the graves other than the presence of an old Spanish bit in one of the more recent burials.

Diseases. Out of about seventeen complete skeletons and six skulls secured in this region by our party those of two children (99-4323, 99-4326) and two adults, one of which was apparently a female (99-4336), exhibited ankylosis of some of the vertebrae. The left ankle bones of the other skeleton (99-4327) showed ankylosis with the tibia and one of the ribs was abnormal. The skeleton of a young child (99-4329) with persistent frontal suture, an example of retarded development was also found.⁴

CONCLUSION.

The connection, nay partial identity, of this culture with that of the Thompson River region in the southern interior of British Columbia is supported by considerable evidence. Small heaps of fresh-water clam shells are found in both regions. The preponderance of chipped points over those ground out of stone, bone and antler; the presence of digging stick handles; pestles with flaring bodies and no striking heads, others with tops in the form of animal heads; celts; the sites of cache pits, of circular summer lodges marked by rings of stones; and of semi-subterranean houses with stones on the encircling ridge; pairs of arrow-shaft smoothers, and bone tubes, were

¹ Spinden, pp. 182 and 252.

² Spinden, p. 182.

³ Spinden, p. 252.

⁴ Cf. Wounds, p. 82.

all found to be common to both regions. The simple pipe bowl found here, although with one exception not found among archaeological objects in the Thompson area is commonly used by the present Indians there. Tubular pipes, modern copper tubes or beads, incised designs consisting of a circle with a dot in it and engraved dentalium shells, each of a particular kind, besides pictographs in red, rock-slide sepulchres, modern graves walled up with parts of canoes, the marking of recent graves with sticks, and the custom of burying artifacts with the dead were also found to be common to both areas. Perforated slate tablets of gorget-form are unknown in both regions. Circles of stones which mark places where cremated human remains were found in this region sometimes indicate graves in the Thompson River region.

Frazer¹ mentions meeting Yakima Indians in the Lillooet Valley which shows that they travelled even beyond the Thompson River country and readily accounts for the dissemination of cultural elements.

On the other hand, many differences in culture are observable. Thus objects made of nephrite and mica which occur, the former being common in the Thompson River valley, were not found in the Yakima area. Quarries and terraced rock-slides such as were seen here are not known to us in the Thompson River region. The bone of the whale occasionally found in the Thompson River country is lacking in Yakima collections. That glassy basalt was not the chief material for chipped implements, as it was in the Thompson River region, is probably due to the scarcity of this material and its use is perhaps as rare in the Yakima valley as on the coast. Chipped implements were made of a greater variety of stone than in the interior of British Columbia, and a greater proportion were of the more beautifully colored materials. No harpoon points made of a unio (?) shell, such as the object found in the Thompson River region or other objects made of such a shell, were seen. Notched sinkers and large grooved sinkers were more commonly found than in the Thompson Valley, while sap scrapers which were common there, were not found in the Yakima district. A great number of pestles made from short cylindrical pebbles, forming a type rather rare in the Thompson River region; many long pestles, of which only four or five have been found in interior British Columbia; and one with a zigzag design not represented among the finds from that region, were found in the Yakima area. Saucer-shaped depressions marking summer lodge sites were not noted by the writer. Clubs made of stone were more numerous and all are of a different type. Clubs or other objects made of the bone of the whale or drilled pendants either circular or

¹ Fraser, p. 175.

elongated were not found. Petroglyphs, pictographs in white, and representations of feather headdresses were not found among the archaeological objects in the Thompson region. Graves in knolls, some with a cyst made of thin slabs of stones constitute another distinct trait of the Yakima area.

There is relatively less evidence of contact with the prehistoric people of Puget Sound and the Pacific coast of Washington, and of southern British Columbia. Several kinds of sea shells, including dentalium, haliotis and pectunculus, which must have come from the coast, were found in the Yakima Valley. Small points chipped from beautiful material found in this region were occasionally seen on the coast, more particularly south of Puget Sound. Glassy basalt was used here perhaps about as much as on the coast. Net sinkers are also about as common here as on the coast from Gray's Harbor southward. The pestles found in the vicinity of Vancouver Island are similar to some of the short pestles found in the Yakima region. Short tubular pipes are found on the coast in the vicinity of the Saanich Peninsula and the Lower Frazer. The pipe previously described as clearly representative of the art of the Northwest coast must have been brought from there or made by a coast artist, not by one merely familiar with the art of the coast. A portion of the material indicative of coast culture that was found in the Yakima Valley may have come up the Cowlitz and down the Toppenish River.

The similarities mentioned are, however, outweighed by marked differences. Large shell heaps — the chief feature of Coastal archaeology — have not been found in the Yakima area, while quarries are unknown to us on the coast. Objects made of nephrite and whale's bone are lacking in the Yakima Valley. A very great number of points rubbed out of slate and bone are found on the coast, but none rubbed out of slate and only a few rubbed out of bone have been found on Yakima sites. Net sinkers are much more common than on the coast, where they are plentiful only from Gray's Harbor southward and in the Lower Columbia Valley. Long pestles with the tops carved to represent animal heads are distinctive of the Yakima area, while cylindrical pebbles used as pestles but slightly changed from the natural form, which are quite common in the Yakima Valley, are rarely found in the Coast country. One style of club made of stone commonly found in this vicinity has not been seen anywhere on the coast, although some clubs made of stone are like specimens from that region. Perforated slate tablets like Coastal gorgets are unknown to us from the Yakima area. Cairns common on the coast are not found in the Yakima country, while the reverse holds true of rock-slide burials. Graves in knolls are unknown on the Pacific, and artifacts are often found in the Yakima graves but they seldom, if ever, occur with ancient burials on the coast.

Much of the material from the Yakima region resembles that which I have seen from the general area including the Columbia Valley between Umatilla and The Dalles, and possibly extending further down the valley. There seems to be a greater similarity of the art products of the Yakima to those of the Thompson River region than to those of the Columbia Valley below the mouth of the Snake, so far as we understand the latter region at this time, and this according to Lewis¹ is certainly not contrary to the belief in an earlier occupancy of this region by the Salish. The culture here resembles that of the Nez Perce region to the east in that a considerable variety of material was used for chipped implements.²

Inter-tribal trade may have been a factor in the production of some observed similarities. It was seen that pipes of three types, one of which is found as far east as the Dakota, another as far north as the Thompson River country, and a third as far west as the Queen Charlotte Islands are all found in this region. It is clear that the ancient people from the Yakima region had extensive communications not only with the region southward as far as The Dalles, but also northward, as far as the more distant Thompson River tribes. If the products of the sea found in this region came up the Columbia, as may be inferred from Lewis,³ it is a good illustration of how trade as a rule, follows the line of least physical resistance; although the migrations of the tribes do not always follow such lines because the lines of trade as a rule are thickly populated by people who resist the migration of their neighbors. Lewis⁴ states that from the coast inward there was only one trade route of importance in the Washington-Oregon-Idaho region and this led up the Columbia River to The Dalles where was found the greatest trade center in the whole region and whither the tribes were wont to come from the north and south as well as from the east.⁵ Klamath,⁶ Cayuse, Nez Perce, Walla Walla and other Sahaptin and probably Salish tribes were all in the habit of going there to traffic. He also states that further east, the Sahaptin in their turn, traded with the Shoshone from whom they obtained buffalo robes and meat. The center for this trade at least in later times was the Grande Ronde in eastern Oregon;⁷ but this later center probably came into being after the advent of the horse. The Okanogan are known to have crossed the mountains to Puget Sound to trade wild hemp for sea shells especially dentalia as well as for other small objects.⁸ The Yakima also in later times crossed the moun-

¹ Lewis, p. 196.

² Spinden, p. 181.

³ Lewis, p. 193.

⁴ Lewis, p. 193.

⁵ Lewis and Clark, IV, p. 286; Ross, (b), p. 117.

⁶ Gatschet, p. 93.

⁷ Wilkes, IV, p. 394.

⁸ Ross, (a), p. 290; (b), I, p. 44.

tains and traded with Puget Sound tribes according to Gibbs,¹ but if this trade were carried on in earlier times its effect in the Yakima Valley seems to have been slight as indicated by the few dentalium shells, the shell pendants shown in Figs. 87-94 and the pipe of coast art, shown in Fig. 127. It is possible that this trade with the coast became customary only after the horse was introduced. There was a considerable amount of trade between the Yakima and the Thompson River and other tribes of British Columbia which was carried on chiefly through the Okanogan.² Lewis³ states that the Walla Walla who lived to the south of the Yakima at least in later times visited as far north as the Thompson River region, and that certain Sahaptin tribes seem to have moved northward and westward and forced back the Salish tribes which at the time of Lewis and Clark's visit were on the north bank of the Columbia and on its tributaries.⁴ These tribes were particularly the Klickitat and the Yakima, an assumption which Lewis states is supported by the definite assertions of the natives themselves. A number of old men positively assured Dr. Suckley that they had pushed their way into the country formerly occupied by the Salish.⁵ The Klickitat, although living in a well wooded region on the southern slopes of Mt. Adams and Mt. St. Helens are thought to have been driven by the Cayuse from their earlier home which was further east and south. Later, they went further west into the Cowlitz Valley.⁶ This may account for the circular pit surrounded by an embankment which I saw near Rochester in Thurston County and interpreted as the remains of a semi-subterranean winter house site. Lewis also states that the Yakima probably lived on the Columbia near the mouth of the river which now bears their name, and are in fact so located by Cox who places them on the north and east side of the Columbia. The pressure of neighboring tribes caused by the coming of the white race no doubt facilitated the adoption of new cultural details.

As late as 1854, the Palus, a tribe living further east on the Palouse River regarded themselves as a portion of the Yakima and the head chief of the Yakima as their chief.⁷ The general similarity of the Walla Walla language to that of the Klickitat and Yakima rather than to that of the Nez Perce is mentioned by Lewis.

Cultural elements, especially those associated with the horse and with the new mode of life which it made possible, probably came from the region

¹ Gibbs, (a), p. 408.

² Cf. Teit, (a), p. 258.

³ Lewis, pp. 194-5.

⁴ Lewis and Clark, VI, pp. 115 and 119; Mooney, pp. 734-736.

⁵ Gibbs, (b), p. 224.

⁶ Swan, p. 323.

⁷ Stevens, XII, p. 200, Pacific R. R. Rept., Pt. I.

to the southeast, and show a great similarity to the Plains type of culture. How much the Plains culture had influenced the Plateau type before the introduction of the horse, is a question.¹ On the Columbia River, near the mouth of the Yakima, were numerous Indians who were visited by Clark in 1805, but he says that while he saw a few horses, the Indians appeared to make but little use of them. If these were the Yakima Indians there must have been quite a change in their manner of living in the next few years.² This agrees very well with the time of the introduction of the horse among the Lower Thompson Indians towards the close of the eighteenth century, according to Teit.³ All this would tend to show that the horse, while common in the Yakima country, about that time, had not yet affected the earlier customs of the natives.

The early culture throughout the great area of which this is a part, according to Lewis, was of a very simple and undeveloped character, which probably accounts for the rapidity with which eastern types were assimilated when once introduced.⁴

Summing up: the prehistoric culture of the Yakima area resembled that of its recent inhabitants, as it will be remembered was the case in the Thompson River region, the Lower Fraser Valley and the Puget Sound country including the coast from Comox on Vancouver Island to Olympia. As a typical plateau culture, being affiliated with the neighboring cultures to the north, east and south, it presented a sharp contrast to both the present and past cultures of the coast to the west. Compared with other branches of the Plateau culture area it must be considered inferior in complexity to its northern neighbor of the southern interior of British Columbia and also to the adjacent branch near The Dalles to the south. While each of these divisions has been influenced by the others more especially in the past, differentiations due to environment or specific historical conditions lead to local variations without obscuring an essential unity of cultural traits.

¹ Lewis, p. 179.

² Lewis, p. 184; Ross, (b), I, p. 19.

³ Teit, (a), p. 257.

⁴ Lewis, p. 180.

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APPENDIX.

The following appendix contains a detailed account of graves with catalogue numbers of their contents and other finds, upon which the preceding descriptions are based.

KENNEWICK.

- 202-8114. Flint chip from the surface. No chips of this quality were found in the Thompson River region.
- 202-8115. Chipped point made of buff jasper from the surface (Plate II, Fig. 1).
- 202-8116. Large grooved pebble from the beach of the Columbia River.
- 202-8117. Chipped pebble from the surface.
- 202-8118. Broken pestle from the surface.
- 202-8119. Chipped and battered hammerstone from the surface. (Fig. 43).
- 202-8120. One half of a sculptured tubular steatite pipe, purchased from Mr. W. F. Sonderman who dug it up while building a flume near Kennewick (Fig. 105).

NORTH YAKIMA.

- 202-8121. Sculptured handle of a digging stick made of the horn of a Rocky Mountain sheep purchased of Mr. W. Z. York, at Old Yakima, who bought it from an Indian woman living near Union Gap below Old Yakima. She, however, may have brought it from some other locality. (Fig. 126).
- 202-8122. Tubular steatite pipe (Fig. 104).
- 202-8123. Pestle made of stone. Presented by Mr. W. M. Gray of North Yakima. Found where the Moxie Ditch enters the flume, about 3 miles north-east of the mouth of the Naches River and southeast of the Yakima River.
- 202-8124. Fragment of rock painted red. Part of a pictograph showing a human figure with feather headdress (Plate XIV, Fig. 1), taken from the basaltic cliffs southeast of the Naches River above the mouth of Cowiche Creek, about four miles northwest of North Yakima. Several other pictographs were photographed here from the north: Plate XV, Fig. 2 (44480, 4-5), white human heads with feather headdresses and white and red double star figure; Plate XIV, Fig. 2 (44483, 4-8), white human heads with feather headdresses, also (44484, 4-9), Plate XV, Fig. 1 (44485, 4-10); Plate XVI, Fig. 1 (44486, 4-11), and Plate XVI, Fig. 2 (44487, 4-12), white and red human heads with feather headdresses.
- 202-8125. Six parts of pebbles, from the surface of the flat on the east side of the Yakima River at "The Upper Gap" near the northern end of North Yakima, as samples of what could have been used as material for arrow points.

100

100

Numbers 202-8126 to 202-8136 are from the quarry shown in Plate III, Fig. 1 (44488, 5-1 from the south, 44489, 5-2, and 44490, 5-3). This quarry is on the ridge top north of the Naches River, about two miles above its mouth (p. 16).

- 202-8126. Stone, possibly a hammer.
- 202-8127. Two river pebbles used as stone hammers.
- 202-8128. Hammerstone (Fig. 40).
- 202-8129. Pebble used as a hammer.
- 202-8130. Fragment of a hammerstone, edge smooth.
- 202-8131. Two fragments of hammerstones.
- 202-8132. Four pieces of raw material for chipped implements.
- 202-8133. Seven pieces of raw material for chipped implements possibly waste from pieces blocked out to be transported or possibly too small or of too poor a quality to be transported.
- 202-8134. Two pieces of raw material, perhaps chipped.
- 202-8135. Two pieces of raw material, perhaps too poor to be transported.
- 202-8136. Thirty pieces of raw material, some very good, some very poor, all apparently waste of pieces blocked out to be transported. No finished or broken implements were found here.

Grave No. 1. Plate vi, Fig. 3 (1910) from north of west of the grave before it was disturbed (p. 14). This grave was about 50 feet up the gully from No. 2, and was excavated by us May 18. It was marked by a stick which was very dry but not yet fully decayed. It was located in the rock-slide on the east slope of the gully, a steep ravine going down from the south to a little flat southeast of the Yakima River. This ravine is on the north side of the hill on the east of the Yakima River at the mouth of the Naches River. The grave was about a mile northeast of the mouth of the Naches River, and about 80 feet above the Yakima. From the spot one can see out over the valley of the Yakima. The grave was on a slight, bench, terrace, or place that could be so interpreted. There were large pits and terraces in the slide above this grave, like those shown in Plate vii. Indications of very old charred cedar strips were found across the grave. Charcoal was found among the rocks, and the grave was bounded by a sort of circular balcony of rocks of the rock-slide and had a slight flat or depression in the center. On top, the stones were large, averaging the size of a man's head, some 30 pounds, some 100 pounds, some the size of a man's fist. Below, covering the body, the rocks were small and many were fine, being chipped small from the same rock by fire. All except this burned rock were the common irregular angular rock-slide material. In the bottom of the grave were found adult human bones, partly charred black, the parts not so charred were yellow. Numbers 202-8137 to 202-8152 were found in this grave.

- 202-8137. Left half of a charred human jaw, parts are ivory black and parts yellowish gray.
- 202-8138. Part of a human vertebra.

- 202-8139. Some charred and calcined bones of a dog with the joint end of the tibia showing the articulation pulled off as in youth. Ashes and black fine masses resembling pulverized charcoal were found in the bottom of the grave. The human bones found with these were probably of two skeletons, but all were much broken and charred. Some yellow brown mass, composed of rootlets, maggot sacks, etc., was found at the sides of the grave.
- 202-8140. At the east side of the grave, a large piece of partly charred cedar about 8 inches wide by 2 inches thick was found.
- 202-8141. Chipped point of obsidian with base broken off, showing that at least some of the contents of the grave were of prehistoric culture.
- 202-8142. Finely chipped point made of brown chert found in fire refuse of this grave (Plate II, Fig. 5).
- 202-8143. Scorched point made of bone (Fig. 9).
- 202-8144. Part of a point similar to 202-8143 and found with it
- 202-8145. Part of a point similar to 202-8143 and found with it
- 202-8146. Part of a point similar to 202-8143 and found with it.
- 202-8147. Tube of rolled brass having the diameter of a lead pencil, proving this grave to have been made since the prehistoric people were able to reach the whites in trade.
- 202-8148. Tube similar to 202-8147 (Fig. 75).
- 202-8149. Charred tube made of bone about $1\frac{1}{4}$ inches long.
- 202-8150. Tube similar to 202-8149 (Fig. 97).
- 202-8151. Scorched tube made of bone and ornamented by incisions running from one end to the other in a spiral course. The tube is charred and about $1\frac{1}{4}$ inches long (Fig. 98).
- 202-8152. Slate disk perforated in the center and at each side. The object is about 1 inch in diameter and $\frac{1}{8}$ inch thick (Fig. 77).

Grave No. 2. Rock-slide grave, about 50 feet down the ravine from grave No. 1 and about 40 feet above the flume. It had grass growing in the center. The grave seemed caved in and as if thoroughly walled like a well. It contained nothing, apparently having been rifled. Before excavation this seemed to be more like a grave than No. 1. (See photograph taken from the southwest.)

Grave No. 3. Rock-slide grave.

- 99-4314. Bleached skull and jaw of an adult purchased of a boy who said it was from a rock-slide grave on the north side of the Yakima Ridge lying east of the Yakima River above the Upper Gap.

Grave No. 4. Rock-slide grave about 6 feet southeast of grave No. 5 at Selah Canon. As this grave had been opened and the skeleton had been disturbed, no accurate description as to its position can be given. Some of the rock-slide material was quite large, weighing from 200 to 300 lbs; depth, 4 feet; diameter, 3 feet. Decayed wood was found in the grave and long poles on the side of the grave. The grave was probably not very old.

- 99-4315. Part of skull and skeleton of a youth which was partly bleached. Found in Grave No. 4.

Grave No. 5. Rock-slide grave in Selah Canon and about 6 feet northwest of grave No. 4. Apparently this grave had been rifled. The adult skull lay to the west and was broken. The skeleton was flexed, the feet were toward the east and the knees south of the vertebrae, that is, the skeleton was on the right side. The grave which was about 75 feet up the hillside, and $1\frac{1}{2}$ miles east of the Yakima River on the south side of Selah Canon, was about $3\frac{1}{2}$ feet deep by $3\frac{1}{2}$ feet in diameter. Long poles lay on the side of the grave while decayed wood, leather thongs and dried flesh yet adhering to some of the bones, in this kind of a grave even in such a dry region as this, especially the last two, suggest the grave to be recent.

99-4316. Jaw and skeleton of an adult. Found in grave No. 5.

Grave No. 6. Rock-slide grave about 100 feet up the hillside at the top of a rock-slide on a point south of the Yakima River about 2 miles northeast and above the mouth of the Naches River. The bones were found in excavating an adjacent barren grave, 5 feet to the northeast and had probably been thrown out of this one on top of it. Pieces of cedar were scattered around the grave, which had been rifled. Its depth was 5 feet, diameter 5 feet.

99-4317. Skull and one hip bone of an adult. Probably from grave No. 6.

Grave No. 7. Rock-slide grave situated northeast of North Yakima and about half a mile northeast of grave No. 6. There is a road near the edge of the grave. The grave had been rifled and pieces of wood were found lying near it; the bones were scattered around and broken. None of them were in anatomical order. Numbers 202-8153 to 202-8156 were found in this grave.

202-8153. One brass bell.

202-8154. Three glass beads.

202-8155. Two shell beads.

202-8156. Three dentalium shells.

Grave No. 8. Rifled rock-slide grave. The skeleton which had been wrapped in cedar bark had been taken away. Nothing besides the cedar bark was found. The grave was found near No. 7 and about a half mile northeast of No. 6. Wood was lying near by. There was a road near the edge of the grave which had been rifled.

Grave No. 9. Rock-slide grave found near No. 7 which was situated about half a mile northeast of No. 6. The grave contained nothing but charcoal. There was wood lying near by. There was a road near the edge of the grave which had been rifled.

Grave No. 10. Rock-slide grave excavated June 2, 1903. This grave was 150 feet up the hill from the Naches River, half a mile above its mouth and on the north side. It was 5 feet long by 6 feet wide and 4 feet deep and had been disturbed and many of the bones thrown out. Dry poles and cedar boards lay around the top. Numbers 99-4318, 202-8157 to 202-8169 were found in this grave.

- 99-4318. An adult skull and skeleton with abnormality on right malor and with one rib expanded, part of a young adult skeleton and part of a child's skeleton were found. Some of the bones were bleached. The adult and the child were on the bottom. These two bodies had been wrapped in bark and placed in a hole one foot deep in the ground below the slide. The adult's head was to the west southwest. On top and to the east northeast was the young adult. Human hair was also found in grave No. 10.
- 202-8157. Four parts of the hearth of a fire drill, similar to that used in the Thompson River region. See Teit, (a) p. 203, for descriptions of fire drills (See also Fig. 38.)
- 202-8158. Wolf or dog bones, some of them bleached.
- 202-8159. Part of a decorated wooden bow (Fig. 114).
- 202-8160a, b. Two pieces of a basket. Doubtless of a finer stitch than those from the Thompson River Indians. See Teit, (a), Fig. 131a and Figs. 143 to 146.
- 202-8161. Piece of coarse coil basket with splint foundation and bifurcated stitch (Fig. 17).
- 202-8162. Piece of a stitched rush mat (p. 86).
The bill of a saw-bill duck was found but not preserved.
- 202-8163. Copper tubes with six beads, short sections of dentalium shells, which were found from the top to the bottom of the grave. These beads were strung.
- 202-8164. Four bone tubes found near the bottom and mostly to the east northeast of the grave.
- 202-8165. Point made of bone found to the west northwest in grave (Fig. 7).
- 202-8166. A perforated cylinder made of steatite found at about the center of the grave (Fig. 99).
- 202-8167. Fishbone.
- 202-8168. Three pieces of yellow jasper (raw material).
- 202-8169a, b, c. Three small arrow points, one found on center, one in east northeast part and one in south of grave. *a* is of brownish fissile jasper (Plate II, Fig. 2).

Grave No. 11. Rock-slide grave located on the north side of the Naches River, a little over half a mile above its mouth. The place is about 600 feet west southwest of grave No. 10 and 150 feet above the river. It was 6 feet by 4 feet in diameter and 4 feet deep. Apparently it had been rifled as nothing was found in it except a skull and a few bones.

- 99-4319. Skull, a lower jaw, and a few broken bones which were scattered among the rocks. The skull was found in the west southwest part of the grave with the face down. The lower jaw was found in the southern part of the grave about 1 foot higher up in the rocks.

Grave No. 12. Bluff pebble grave. We examined a ring of river boulders on the twenty-acre farm of Mr. James McWhirter, a boy about fifteen years old, twelve miles up the Naches River on the crest of the foothill terrace north of the road, and overlooking the bottom along the north side of the Naches River. This grave was about 150 feet high above the river by about half a mile from it. At first it looked like a

little underground house site or a shallow cache pit. (Museum negative, no. 44441, 1-2 for general locality.) James, who called our attention to the pile of boulders, said that some one threw off part in an abandoned attempt to dig the grave. We thought the grave practically undisturbed and it proved to have been the least disturbed of any we had found up to this point. The outside of the ring was 10 feet east and west by 5 feet north and south. The inside of the ring or the space surrounded was 6 feet east and west by 4 feet north and south. Probably this grave was a boulder heap, the aspect of a ring being given by the removal of the stones, i. e., this central space may be where stones were thrown off. River boulders were found from top to bottom. The boulders varied in weight from about 7 to 30 pounds. Most of them were disk-shaped but some were oval. Numbers 99-4320 and 202-8170, 1 were found in this grave.

- 99-4320.** An adult skeleton was found 4 feet deep with the head towards the west, resting on its occiput. The skull which was broken, faced south by east, with the mouth open. The knees were north; the body was on its left side and flexed. Over the north side of the knees was an elliptically-shaped piece of cedar burned on the upper side. It was about 2 feet wide by 4 feet long. A few fragments of the skeleton of a child were found in the grave. All the bones in the grave were very soft and as the ends were broken off we discarded all but the skull and a few of the bones of the child. Two shell disks (202-8170, 1) were found about 6 inches apart near the neck, one at the south shoulder, and one at the south side of the skull of the adult.
- 202-8170.** Pendant of disk shape made of oyster shell with one perforation near the edge (Fig. 94).
- 202-8171** Pendant of disk shape made of shell with two perforations near one edge (Fig. 93).

Grave No. 13. Cremation circle, similar to several of the others on the terrace northwest of the mouth of the Naches River. This consisted of a ring of angular rocks among which were no river pebbles, resembling a small underground house site, 8 feet in diameter outside, 6 feet in diameter at the top of the rocks, $4\frac{1}{2}$ feet in diameter inside, both east-west and north-south. It is widest and built of largest stones on the side towards the lower part of the terrace, suggesting that the ring had slid down but the nearly level terrace would argue against this idea. This grave was like a rock-slide grave, filled with soil, but on a gently sloping terrace instead of a steep slide. Photograph no. 44495, 5-8, from the south shows a telegraph pole to left and a flume across the Yakima River to the right. See also graves No. 14 and 15. Child bones, found two feet deep in volcanic ash, were decayed and discarded. The tibiae were about $2\frac{1}{2}$ inches long.

Grave No. 14. This cremation circle was situated on the terrace about 100 feet above the Naches River and about 250 yards north of the two bridges near its mouth. Plate ix, Fig. 1 (photograph no. 44493, 5-6) shows this from the east with telegraph poles beyond. The stone circle

measured 6 feet north and south inside (16 outside) by 7 feet east and west inside (14 outside). Our excavation here was 6 by 5 by 4 feet deep. Fragments of charred human bones, and some that seemed not to be charred, of six or seven individuals were found from about 1 foot deep down to 4 feet deep. Most of these were pieces of skulls, but pieces of many other bones were found. The bones which were most burned, were those found nearest the surface. Much charcoal was seen. A layer of ashes about 6 inches in thickness was found in the center. In the northwest part of the hole a skeleton was found lying on the left side flexed, the face east, and the head north. This may have been buried after the others. The bones were very much decomposed and the skull was broken into small pieces. Numbers 202-8172 to 202-8174 were found in this grave.

202-8172. A shell ornament found on the east side of the skull.

202-8173. Two dentalium shells found on the west side of the skull. Dentalium shells were found in all parts of the excavation but were most numerous in the northeastern parts.

202-8174. A shell ornament.

Grave No. 15. Cremation circle excavated on June 10, 11 and 12. Shown from the east in photograph No. 44494, 5-7. It is 56 feet west of grave No. 14 and further up the terrace. The outside circle of stones measured 15 feet north and south by 15 feet east and west. The next circle of stones measured 9 feet north and south by 9 feet east and west. The space inside the stone circle measured 7 feet north and south by 7 feet east and west. The depth varied from 2 feet 6 inches in the east and south parts to 4 feet in the north and west parts below all of which was a pitching layer of basaltic rocks. The three rings of stones surrounded a hollow. The inner row was about 12 inches lower than the outer ring. Several boulders were found in the grave. Ashes and lava composed the grave soil. The whole cremation circle seemed to have been the burned remains of a communal or family depository for the dead, probably a hut like an underground winter house walled around the edge of the roof with stones. Two skeletons were found on the bottom, apparently not burned, but much decayed. They were discarded. Numbers 202-8175 to 202-8182 were found in this grave.

202-8175. Charcoal was abundant but most of it was found about 14 inches deep.

202-8176. Broken and charred human bones of about twelve individuals were found throughout the grave in a space about 8 by 5 feet beginning at the east inner ring of stones and extending beyond the second circle on the west. They were found from 8 inches deep to parts of the bottom.

202-8177. Dentalium shells were very abundant.

202-8178. Engraved dentalium shells (Fig. 118).

202-8179. Several kinds of shell ornaments were found in the northern and northwestern parts of the grave.

202-8180. Several burned pieces of shell.

202-8181. One piece of metal, probably copper.

202-8182. Several pieces of shell of different kinds.

Grave No. 16. Shallow cremation circle, 13 feet north and south by 14 east and west (outside); 5 feet north and south by 7 feet east and west (inside). Charred human bones of a child about 10 years old were found.

Grave No. 17. Cremation circle situated 58 feet west from grave No. 15 and 46 feet west from grave No. 16. Its diameter was 13 feet east and west by 14 feet north and south outside of all stones. The diameter was 5 feet east and west by 6 feet north and south inside. At the middle of the stone ring the diameter was 9 feet. The middle of the excavation was 3 feet deep in volcanic ash. No evidence of burning was found among the bones except the presence of charcoal at a depth of four feet. Parts of at least four skeletons, one adult, and children were found, all much broken and separated. The bones were mostly in the southwestern end of the excavation. No skull bones were found except a lower jaw, while in grave No. 13 most of the pieces found were of skulls. Numbers 202-8183 to 202-8185 were found here.

202-8183. Three shell ornaments found in the northeastern part of the grave.

202-8184. Two dentalium shells found in the western part of the excavation. These were the only two found in the whole grave.

202-8185. Piece of copper found in the northwestern part of the grave.

Grave No. 18. Cremation circle situated 84 feet south of grave No. 14. This grave had possibly been rifled. The stone circle was 15 feet in diameter outside and 9 feet in diameter inside. The excavation was 2 feet, 6 inches to 3 feet 6 inches deep. Excavation 7 feet by 6 feet. Some fragments of human bones were found on the surface. There were more stones mixed in the earth than in the graves previously excavated here; viz: Nos. 13 to 17. Ashes were abundant especially at the bottom. Many pieces of much broken human bones were found but not as many as were seen in grave No. 15 and they were less burned than in that grave. Numbers 202-8186 to 202-8187 were found in this grave.

202-8186. Two engraved dentalium shells.

202-8187. Two dentalium shells of which one was crushed and discarded. A broken flat shell ornament which we also discarded, was found here.

Graves Nos. 19-20. These cremation circles were of the usual construction, showed nothing new and contained no specimens.

Grave No. 21. Cremation rectangle last explored on the terrace near the mouth of the Naches River and situated 300 feet northwest from the two bridges. The rectangular enclosure was bounded by a single row of stones, but on the south several rows were placed outside to conform with the slope of the hill covering a semicircular area, while on the west was a second row of marking stones. It was 12 feet long north and south by 8 feet wide east and west and 3 feet, 6 inches deep. Part of a child's skull, two scapulae, two tibiae, and a piece of a femur, of another child; bones of a young adult; a small piece of skull and

part of a femur of an adult were found. All the bones were in a good state of preservation. Numbers 202-8188 to 202-8189 were found in this grave.

202-8188. Dentalium shells.

202-8189. A shell ornament was found in this excavation. A piece of beaver tooth and several pieces of decayed cedar were also found and discarded.

99-4321. See grave No. 25.

Grave No. 22. Rock-slide grave located near the top of the slide and above the flume on the southern side of the Yakima Ridge on the northern side of the Yakima River about a mile eastward from the mouth of the Naches River. Traces of wrappings of stitched rush matting were seen in the grave.

99-4322. Adult skeleton, partly bleached, flexed on back, head north as shown in situ after removing covering rocks in photograph (no. 44516, 7-6 from the south by west), Plate VIII, Fig. 2 (pp. 15 and 142).

Grave No. 23. A grave 600 feet up on the plateau south of Oak Spring Canon, in a dome-shaped mound of volcanic ash left by the wind. It was not like a rock-slide grave. Somewhat angular stones unlike rock-slide material among which were no pebbles, formed a rectangular pile, 15 feet long by 12 feet wide. The grave contained many stones, several modern beads, evidently part of a rosary, two dentalium shells and a human lower jaw, but all were discarded.

Grave No. 24. This grave was located in a dome of volcanic ash on the hill or plateau north of the Ahtanum River and northwest of Mr. A. D. Eglin's house near Tampico. It was marked by a rectangular group of rough and wind smoothed rocks (not rock-slide or river pebble) which extended down as in the crude cairns, 6 feet northeast and southwest by 4 feet wide northwest and southeast, the vault being 5 feet by 3 feet. Numbers 99-4323 and 202-8190 were found in this grave.

99-4323. A skeleton of a child found in a very much decomposed condition. Some of the bones showed anchylosis. The skull was found in the southwest of the grave with part of the pelvis, two humeri and a scapula. The rest of the skeleton was scattered, the lower jaw being in the northwest corner of the grave with the femora, tibiae and fibulae. The skull faced northeast and rested on the occiput.

202-8190. Bone point found at the side of the skull.

99-4324. See grave No. 27.

Grave No. 25. Eglin stone grave located in a volcanic ash knoll left behind by wind and surrounded by 'scab land' on the bottom land about 18 miles up and west of North Yakima or nearly to Tampico, Yakima County, and on the north side of the river road, but east of the north and south branch road which is east of Mr. Sherman Eglin's place; about 600 feet north of the north branch of the Ahtanum river and about 15 feet above the water level. Over the grave was a stone heap of

angular basalt about 8 feet in diameter. At a depth of 3 feet, after finding stones all the way down, was a cyst (Negative, nos. 44498, 5-11 and 44499, 5-12, reproduced in Plate x, from the same station looking east), made up of slabs averaging 2 inches in maximum thickness with thin sharp edges about 2 feet by 18 inches and smaller. There were two such cover stones, some at the sides and ends. Sometimes two or three such slabs were found parallel or overlapping. There were no slabs or floor below the skeleton. This grave resembled very much the stone graves of Ohio and Kentucky except that the slabs were not of limestone and there was a pile of rocks over the stone cyst. Numbers 99-4321, and 202-8191 to 202-8195 were found in this grave.

99-4321. In the cyst about on a level with the lower edges of the enclosing slabs was the skeleton of a child about six years old with head west, face north, and the knees flexed on the left side. The skull was slightly deformed by occipital pressure (Plate x).

202-8191. Horizontally under the vertebrae was found an engraved slab of antler in the form of a costumed human figure with the engraved surface up (Fig. 121).

202-8192. Dentalium shells were found under the body, from the neck to the pelvis.

202-8193. Ten engraved dentalium shells (Fig. 117).

202-8194. A bit of bone.

202-8195. Charcoal found in this grave.

The grave (No. 25) and its contents seem to antedate the advent of the white race in this region or at least show no European influence.

99-4322

to

99-4323 See graves nos. 22 to 24.

Grave No. 26. Rock-marked grave in a dome left by the wind near the pasture gate on Mr. A. D. Eglin's place and about half a mile north of his house near Tampico. A heap of somewhat angular wind abraded rock some being smooth, (none being river pebbles or rock-slide material) marked the grave and extended below the surface about two feet. Then about 1 foot of earth intervened between them and thin rocks found around the bones of a very young child. The skull was in the northwest end of the grave and was disarticulated. The depth was 4 feet, the length of the excavation 4 feet, and the width 3 feet. The skeleton was found with the head northwest and the pelvis southeast. A grave with outward appearance resembling this except that it had river pebbles among the stones of the pile is shown in Fig. 2, Plate ix, (Negative no. 44497, 5-10 taken from the north of east).

Grave No. 27. Rock-marked grave in a dome of volcanic ash left by the wind located about half a mile north of Mr. A. D. Eglin's house near Tampico. This grave was like a rude cairn being rudely walled and found filled with earth and stones as well as covered by rocks of which eight or nine weighing about 15 or 20 pounds, showed above the surface of the ground. Its depth was 4 feet, length 5 feet, and its

width, 3 feet 6 inches, extending west southwest and east northeast.
A little charcoal was found in this grave also.

99-4324. Adult skeleton found flexed on left side, facing northeast.

Grave No. 28. Rock-slide grave located in a small irregular rock-slide on the north side of Cowiche Creek about 3 miles west of its mouth and about 40 feet above the road. The rocks were piled up in a crescent-shaped ridge on the lower side of the grave. Four sticks about four feet long were found planted upright among the stones. The grave extended east and west. Parts of a human skeleton were found. It was in a flexed position, head west, skull and the bones of the upper part of the body broken and decomposed. The bones of the lower part of the body were well preserved. The skeleton had been wrapped in matting or bark, several pieces of matting being found in the grave as well as parts of a basket. Numbers 202-8196a and 202-8196b were found in this grave.

202-8196a. Chipped point of mottled quartz found near the skull (Plate II, Fig. 3).

202-8196b. Chipped point of white quartz found near the skull (Plate II, Fig. 4).

202-8197. Pestle or roller made of stone from the surface about a mile east of Fort Simcoe. This is of cylindrical shape tapering to both ends but to one more than to the other. Both ends are fractured (Fig. 37).

Grave No. 29. Rock-marked grave located on a plateau above Wenas Creek near its mouth and about seven miles north of North Yakima. The rocks marking the grave covered a space 6 feet by 4 feet and extended down to the skeleton which was very much broken but not decomposed. No objects other than some charcoal were found in this grave. All the other graves in the vicinity of the mouth of Wenas Creek seem to have been rifled.

202-8198. Broken ulna of a deer found at the mouth of Wenas Creek about 7 miles north of North Yakima.

Numbers 202-8199 to 202-8204 were found on the surface at the mouth of Wenas Creek.

202-8199. Small chipped point made of red jasper.

202-8200a-c. Three chipped points made of white chert.

202-8201. Broken and burned chipped point made of white chert.

202-8202. Broken triangular chipped point made of white chert.

202-8203. Chipped point made of reddish white chert (Plate II, Fig. 13).

202-8204 a, b. Two chipped pieces of white chalcedony.

Numbers 202-8205a-e to 202-8206f were found in the valley of Wenas Creek, on the surface near where the trail from North Yakima to Ellensburg crosses the creek, about 7 miles north of North Yakima.

202-8205a-e. Five pieces of agate of reddish or amber color.

202-8205f. Agate of whitish color

202-8206a. A chip of stone.

202-8206b-e. Four pieces of stone.

202-8206f. Chip of stone.

Numbers 202-8207 to 202-8209 were found on the surface at the mouth of Wenas Creek.

- 202-8207. Pestle made of stone.
202-8208. Pestle made of stone.
202-8209. Broken pebble, battered on the side.
202-8210. Fragment of a pestle made of stone of nearly square cross section. Found on the surface three miles north of Clemen's ranch, on Wenas Creek where the trail from North Yakima to Ellensburg crosses.
202-8211. Pestle found about 28 miles north of North Yakima, on the trail to Ellensburg. It was in a dry creek in "Kittitass" Canon. This canon is probably the Manastash not the "Kittitass," as we were told.

ELLENSBURG.

- 202-8212. Base of a triangular chipped point made of jasper found on the surface near the town reservoir on the ridge east of Ellensburg.

Numbers 202-8213 to 202-8222 were found on the surface of the bottom land west of Cherry Creek, near Ellensburg. The place was a village site and is on the farm of Mr. Bull near where an east and west road crosses the creek, and opposite where the creek touches on the east, the west base of the upland. At this point the creek comes up to the upland from the lowland to the north (p. 12).

- 202-8213. Chipped boulder.
202-8214. Notched boulder, or net sinker.
202-8215. Battered pebble.
202-8216. Four burned stones.
202-8217. Gritstone, probably a whetstone.
202-8218. Pebble.
202-8219. Unio shells.
202-8220. Six chips.
202-8221. Scraper chipped from chalcedony (Fig. 52).
202-8222. Chipped point of heart shape made of clove brown jasper. (Plate II, Fig. 12).

Grave No. 30. Stone circle located on the crest of a western extension of the Saddle Mountains on Mr. Bull's farm, east of Cherry Creek and about seven miles south of Ellensburg. The place is east of the village site above-mentioned which is on the bottom land along the west side of the creek at this point. A circular ring of stones, 10 feet in diameter marked the grave. Smaller stones and earth in the middle extended 3 feet 6 inches down to the skeleton. No objects were found except a plentiful supply of charcoal.

- 99-4325. The bones of an adult human skeleton which appeared as if it had been flexed were found very much out of anatomical order. It lay north-east and southwest in the southeast part of the grave. There was a large hole in the right frontal of the skull which lay facing the north-west. The lower jaw was found on top of the skull with its angle east. Fragments of the tibiae were blackened by fire.

Grave No. 31. Rock-slide grave located in the rock-slide on the west side of the bluff, a western extension of the Saddle Mountains, east of Cherry Creek

and about half a mile southwest of Mr. Bull's house. One small piece of decayed wood was found projecting above the rock-slide, and it was the only indication of the grave, there being no cavity over it. Among the rocks, four more posts were found, one at each corner of the grave. These had evidently rotted off even with the surface, having formerly, no doubt, extended above it. The depth of the grave was from 2 to 3 feet, according to the slope of the hill. Numbers 99-4326 and 202-8223 to 202-8228 were found in this grave.

- 99-4326. Skeleton of a child with anchylosed neck vertebrae. Some of the bones were bleached. The bones were very much displaced, the skull being found in the middle of the grave and some of the vertebrae being found near the surface, but most of the bones were around the skull. The body dressed and wrapped in matting had been placed between four large boulders.
- 202-8223. Fragments of leather or skin clothing.
- 202-8224. Dentalium shells.
- 202-8225. Glass beads.
- 202-8226. Three bracelets made of iron (Fig. 96).
- 202-8227. A bone disk with central perforation (Fig. 80).
- 202-8228. A bit of a fresh water shell.

Grave No. 32. Rock-slide grave located about 30 feet south southwest of grave No. 31 and in the same rock-slide. It had the same characteristics but had evidently been disturbed, the skull being missing. No artifacts were found in the grave.

- 99-4327. Adult skeleton without skull and some bones of a little child. The bones of an adult were found in a heap except the vertebrae which lay extended full length; cervical vertebrae to the north. The bones of one ankle, a tibia, and fibula were diseased. The cervical vertebrae are anchylosed; and one of the ribs is abnormal. The bones of the knees are partly bleached. The bones of the child being found between the ribs and the pelvis suggest that it was foetal.

Grave No. 33. Rock-slide grave located 40 feet south southwest from grave No. 31 in the same rock-slide with it. There was nothing on the surface to indicate this grave, but below the surface of the slide on the upper side of the grave, were three rows of sticks, about 3 feet long, standing vertically and close to each other. These seemed to be so placed that they would prevent the slide from further movement towards the grave. The grave cavity was 5 feet south southeast by 4 feet east northeast and 4 feet deep on one side, 3 feet on the other, or averaging about $3\frac{1}{2}$ feet deep, and extending into the soil below the slide. Numbers 99-4328 and 202-8229 to 202-8230 were found in this grave.

- 99-4328. In the bottom of the grave the skeleton of a youth was found. It was in good condition, lying on its back, facing west, but having rolled westward. The legs were flexed so that the femora lay at right angles or to the southeast of the pelvis, and the tibiae and fibulae lay parallel to them. The arms lay extended at the sides of the body with the hands on the pelvis. Three of the arm bones and one

pelvis bone are stained by copper. The tibia of a child was found with these.

202-8229. Mat of twined rushes found under the pelvis. The rushes were stitched together in pairs with cord and each pair was twisted once between each stitch (Fig. 71).

202-8230. Open twine matting of rushes held together with cords woven around them, skin with hair on it, and in this were copper beads strung with beads made of dentalium shells on a leather thong (Fig. 72).

Grave No. 34. Rock-slide grave found 5 feet south southwest of grave No. 32. There were no surface indications of the grave. Posts of decayed wood were found extending from the surface down to about 6 inches from the bottom. The tops appeared to have been cut off and probably never extended above the surface. Numbers 99-4329 and 202-8231 to 202-8246 were found in this grave.

99-4329. The skeleton of a young child with a persistent frontal suture was found at a depth of from 3 to 4 feet with the head east, trunk on back, femora at right angles to tibiae, and fibulae parallel to them. flexed to left or south.

202-8231. Skin with the hair on found on body.

202-8232. Matting.

202-8233. Several rows of beads, some of copper, others of glass and still others of sections of dentalium shells were found at the neck, arms and legs. These are strung on pieces of thong, some of which are wound at the ends. Some of them are on coarse twisted, and others on fine twisted plant fibre (Fig. 74).

202-8234a, b. Two pendants made of haliotis shell were found, one near the head and one at the pelvis (Fig. 91).

202-8235a, b. Two copper pendants were found at the legs. *b* has a thong in the perforation.

202-8236a-d. Four bracelets made of copper found on the arms (Fig. 95).

202-8237. Teeth of a rodent found in the grave.

202-8238. A square pendant made of copper with a thong and bead made of copper (Fig. 78).

202-8239. A pendant made of copper (Fig. 83).

202-8240. A bit of wood bounding a knot hole.

202-8241. Two dentalium shells.

202-8242. A piece of iron.

202-8243. Woodpecker feathers, some bound at the tips with fabric, one with feather, and fur or moss.

202-8244. A copper ornament found among the rocks over this grave about 1 foot deep.

202-8245. A pendant made of brass with thong and bead made of copper found among the rocks over this grave about 1 foot deep (Fig. 84).

202-8246. A pendant made of copper with thong found about 1 foot deep among the rocks over this grave (Fig. 82).

Grave No. 35. Rock-slide grave located in the same slide with Nos. 31, 32, 33 and 34, 8 feet to the south southwest of No. 34. The grave was 3 feet in diameter by 4 feet deep. Four posts of poplar were found at the

corners of this grave but these did not show above the surface being decayed down to within 6 or 8 inches of the ground under the rock-slide. Sticks had also been used to mark this grave on the surface. Numbers 99-4330 and 202-8247 to 202-8249 were found in this grave.

99-4330. The skeleton of a youth was found resting on its back with the head to the east, arms at the sides, legs flexed at right angles, i. e., to the north. Two buttons, one of bone and one of pearl, or shell, and a bridle bit were found in the grave, but were discarded.

202-8247. A bit of shell.

202-8248. Thirteen cones made of iron (Fig. 86).

202-8249. Two pendants made of iron (Fig. 85).

Grave No. 36. A rock-enclosure burial located on the hill south of Mr. Bull's house near the gap south of Ellensburg and about 300 feet north of grave No. 30. This burial was the southwestern of a group of eight, all very close together and of which the southern circular enclosure of five had been rifled although the three oblong enclosures were intact. There were traces of human bones in all of the eight enclosures. The enclosure to the north contained a skeleton that had been burned. No. 36 differed from No. 30 in that the stones did not extend below the surface.

99-4331. At a depth of 3 feet, in the grave pit 5 feet by 3 feet was the skeleton of an adult lying with the head north, face east, on the left side, arms extended to pelvis, legs flexed to left, i. e., to east. No specimens were found in this enclosure.

Grave No. 37. A rock-slide grave was located about 10 feet west of grave No. 35 and was similar to it in general character. Numbers 99-4332 and 202-8250 to 202-8258 were found in this grave.

99-4332. The very much decomposed skeleton of a child was found here. The broken skull was preserved.

202-8250a, b. Two fragments of antler, perhaps part of an implement found about 1 inch above the pelvis.

202-8251. A triangular copper object with two perforations found inside the skull.

202-8252. A pendant or nose ornament made of haliotis shell and stained pink in places found on the lower jaw (Fig. 92).

202-8253. Dentalium shells.

202-8254. A long shell pendant with two perforations.

202-8255. A pendant made of haliotis shell bearing a pink stain with a perforation and part of a second perforation (Fig. 90).

202-8256. A long shell pendant with one perforation.

202-8257a, b. Two triangular objects made of shell.

202-8258. Pieces of shell found near the lower jaw.

PRIEST RAPIDS.

202-8259. One pebble showing use at the end as a pestle. Found on the surface of the divide 25 miles east of Ellensburg, and about 15 miles west of Mr. Craig's house near the head of Priest Rapids.

202-8260a, b. Pieces of a pestle made of part of a column of basalt, with the corners rounded by pecking. Found on the surface at the head of Priest Rapids on the west side of the river.

202-8261. A pestle made by rounding the edges of a piece of a basaltic column. Found on the surface of the west bank of the Columbia River 8 miles above Mr. Craig's house, which is at the head of Priest Rapids.

Numbers 202-8262 to 202-8266 were found on the surface near the head of Priest Rapids.

202-8262. A pestle or part of a pestle.

202-8263. A river pebble partly pecked into the form of a pestle (Fig. 22).

202-8264. The end of a pestle having a large striking head.

202-8265. Part of a stone pestle.

202-8266. Pestle formed by rounding the corners of a small basaltic column.

202-8267. Numbers 202-8267 to 202-8290 are pestles made of stone found on the surface near the head of Priest Rapids (Fig. 21, 202-8281).

to
202-8290.

Numbers 202-8291 to 202-8295 were found on the surface near the head of Priest Rapids.

202-8291. Part of a pestle made of stone.

202-8292a. A pebble battered on each end (Fig. 41).

202-8292b. Pebble, one side of which has been used as a mortar.

202-8293. Part of a mortar made of stone.

202-8294. Part of a mortar.

202-8295. Disk-shaped boulder, one side of which is notched opposite a natural notch. Possibly this has been a net sinker similar to the following.

Numbers 202-8296 to 202-8334 were found on the surface of the bank of the Columbia River near the head of Priest Rapids.

202-8296. River pebble. Such pebbles were made into sinkers for fish nets. See 202-8310 and adjacent catalogue numbers (Fig. 13a).

202-8297. Scraper or knife made of a river pebble one side of which is chipped (Fig. 55).

202-8298. River pebble of disk shape, partly chipped.

202-8299. River pebble of disk shape, partly chipped on two edges.

202-8300. River pebble of disk shape, partly chipped on one edge.

202-8301. River pebble of disk shape, partly chipped on two edges.

202-8302. River pebble of disk shape, partly chipped on four edges (Fig. 53).

202-8303. River pebble, partly chipped.

202-8304. River pebble of disk shape, chipped around the edge from one side only.

202-8305. Disk-shaped river pebble, chipped around the edge from both sides.

202-8306. Disk-shaped river pebble, chipped in two places, opposite each other from both sides, and at a place equi-distant from these two from only one side.

202-8307. Scraper or knife chipped from a pebble (Fig. 54).

202-8308. Chipped pebble.

202-8309 to 202-8322 are oblong flat river pebbles with a notch chipped in the edge at each end from both sides. They are probably sinkers for fish nets. (202-8313, see Fig. 13c; 202-8318, see Fig. 13b).

- 202-8323
to
202-8325. Numbers 202-8323 to 202-8325 are oval flat river pebbles with pieces chipped from the edges in several places.
- 202-8326. Flat oval river pebble with pieces chipped from both sides of the edge at five places, probably a sinker for a fish net.
- 202-8327. Flat disk-shaped pebble with four notches about equi-distant around the edge, and chipped from each side, probably a sinker for a fish net.
- 202-8328. Oval river pebble with four notches chipped in the edge nearly equi-distant from each other, probably a sinker for a fish net.
- 202-8329. Oval flat river pebble with four notches chipped in the edge from both sides, and about equi-distant from each other, probably a sinker for a fish net.
- 202-8330. Oval flat river pebble with four notches chipped in the edge from both sides, and about equi-distant from each other, probably a sinker for a fish net (Fig. 13*d*).
- 202-8331. Half of a stone ring, probably a sinker for a fish net.
- 202-8332. Boulder in which groove is partly pecked, probably a net sinker or anchor.
- 202-8333. Large chipped implement made of basalt (Plate I, Fig. 1).
- 202-8334. Large chipped form made of white chert (Plate I, Fig. 3).
- Numbers 202-8335 to 202-8383 were found on the surface near the head of Priest Rapids.
- 202-8335. Chipped form.
- 202-8336. Chipped form of white chalcedony (Fig. 3).
- 202-8337. Chipped form.
- 202-8338. Chipped form made of red jasper (Plate I, Fig. 2).
- 202-8339
to
202-8344. Numbers 202-8339 to 202-8344 are chipped forms.
- 202-8345. Basal half of a chipped point.
- 202-8346. Half of a chipped form.
- 202-8347. Point of a chipped form.
- 202-8348. Part of a chipped form.
- 202-8349
to
202-8354. Numbers 202-8349 to 202-8354 are points of chipped forms.
- 202-8355. Triangular chipped point.
- 202-8356. Triangular chipped point.
- 202-8357. Chipped form.
- 202-8358. Chipped point.
- 202-8359. Chipped point made of brown horn stone (Plate II, Fig. 11).
- 202-8360. Triangular chipped point made of pale yellow chalcedony. The chalcedony is flint-like in texture (Plate II, Fig. 14).
- 202-8361. Chipped point made of yellow agate (Plate II, Fig. 10).
- 202-8362. Chipped point.
- 202-8363. Chipped point made of pale fulvous chalcedony (Plate II, Fig. 8).
- 202-8364. Chipped arrow, knife or spear point made of chalcedony (Fig. 2).
- 202-8365. Chipped arrow, spear or knife point.
- 202-8366. Chipped arrow point made of pale fulvous chalcedony (Plate II, Fig. 7).

- 202-8367. Chipped arrow point.
202-8368. Chipped arrow point made of opaline whitish chalcedony (Plate II, Fig. 9).
202-8369. Chipped arrow point made of chalcedony (Fig. 1).
202-8370. Point for a drill chipped from chert (Fig. 48).
202-8371. Scraper chipped from petrified wood (Fig. 49).
202-8372. Scraper chipped from agate (Fig. 50).
202-8373. Scraper chipped from chalcedony (Fig. 51).
202-8374. Chipped piece of chalcedony.
202-8375. Chipped piece of petrified wood.
202-8376. Flake of stone.
202-8377. Flake of stone.
202-8378a. Piece of antler showing knife marks.
202-8378b. Part of a wedge made of antler.
202-8379. A piece of antler that has been whittled.
202-8380a, b, c. Three pieces of antler.
202-8381. Bleached barb for a fish spear made of bone (Fig. 12).
202-8382. Six clam shells from the Columbia River.
202-8383. Seventeen clam shells from the old shell bed shown in Plate v, Fig. 1.
202-8384. Four shell disks found among the refuse of a rock-slide grave near the head of Priest Rapids (Fig. 76).
202-8385. One dentalium shell found among the refuse of a rock-slide grave near the head of Priest Rapids.
202-8386. Pendant made of haliotis shell, triangular in form, perforated at the most acute corner. This shell came from the Pacific Coast. Found in the grave of a child in a rock-slide near the head of Priest Rapids west of the Columbia River near the home of Mr. Craig (Fig. 89). Numbers 202-8387 to 202-8390 were also found here.
202-8387a, b, c, d. Vertebrae of a fish.
202-8388. Pendant made of a shell probably a young *Pectunculus gigantea*. The hinge side has been smoothed off (Fig. 88).
202-8389. Three dentalium shells.
202-8390. Twenty-eight shell disks or beads.

Grave No. 38. A rock-slide grave located on the east side of the escarpment that runs south to the Columbia River about two miles southwest of Mr. Craig's house near the head of Priest Rapids. Stones were heaped up over this grave and sticks about 6 feet long were standing up and extended from the earth above the skeleton to 3 feet above the surface. Numbers 99-4333 and 202-8391 to 202-8392 were found in the grave.

- 99-4333. An adult skeleton was found at a depth of 3 feet from the top of the rock heap. The head was east. The skeleton was flexed and it was lying on the left side.
202-8391. Stitched rush matting, probably recent, found in contact with the skin on this skeleton (Fig. 70). Part was of the stitch shown in Fig. 71.
202-8392. A roll of birch bark.
Grave No. 39. Grave of a child near grave No. 38. This child's grave was of the same kind as grave No. 38.
202-8393. Pendant or bead made of sea shell (Fig. 87)

Grave No. 40. A rock-slide grave found 8 miles above Mr. Craig's house in a small slide at the foot of the bluff. Upright cedar slabs about 8 feet long were found along about 6 feet of the lower part of the grave. The skeleton of an adult lay flexed along the slabs with the head to the north.

99-4334. The skull.

Several similar graves, most of which have been rifled, were seen at this place.

Grave No. 41. Grave found about 5 miles south of Mr. Craig's house on the western bank of the Columbia. It was in the sand, covered with flat river boulders. No artifacts were found in the grave.

99-4335. Adult skeleton, bleached. Much of the skeleton was found exposed and parts were missing. The head was north.

Grave No. 42. Boulder-covered grave in sand was located at the edge of the river 12 miles up the Columbia from Mr. Craig's house. Numbers 99-4336 and 202-8394 to 202-8395 were found in this grave.

99-4336. An adult skeleton was found in this grave with the head north, face down, and flexed.

202-8394. Fragment of a large mortar made of stone (Fig. 18).

202-8395a, b, c. Three pestles found among the covering boulders of this grave.

Numbers 202-8396 to 202-8398 were presented by Mrs. J. B. Davidson of Ellensburg. The specimens were collected at the head of Priest Rapids.

202-8396. Pipe made of limestone decorated with the circle and dot design similar to that used in the Thompson River region (Fig. 106 also negative 44505, 6-6).

202-8397. Double notched point chipped from black glassy basalt or trap (Plate II, Fig. 6).

202-8398. Point for a drill or perforator chipped from chalcedony (Fig. 47).

202-8399. River pebble partly pecked into the form of a pestle. Found on the surface 8 miles above the head of Priest Rapids (Fig. 23).

VARIOUS LOCALITIES.

Numbers 20.0-1463 to 20.0-1471 were collected and presented by Mr D. W. Owen of Kennewick.

20.0-1463. Bone object broken and partly missing from Blalock Island fifteen miles below Umatilla in the Columbia River.

20.0-1464. Wedge made of antler from the surface near the Columbia River near the mouth of the Snake River (Fig. 39).

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Numbers 20.0-3344 to 20.0-3346 are from an old village site near Fort Simcoe. Collected by Dr. H. J. Spinden.

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- 20.0-3345. Pestle.
- 20.0-3346. Pestle.

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PICTOGRAPHS AT MOUTH OF COWICHE CREEK.

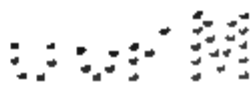
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ANTHROPOLOGICAL PAPERS
OF THE
American Museum of Natural
History.

Vol. VI, Part II.

**THE PREHISTORIC ETHNOLOGY OF A
KENTUCKY SITE.**

BY
HARLAN I. SMITH.

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THE PREHISTORIC ETHNOLOGY OF A KENTUCKY SITE.

BY HARLAN I. SMITH.

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INTRODUCTION.

The Fox Farm is situated in Mason County, Kentucky, about fourteen miles south southwest from Maysville, three miles north from May's Lick, and one mile west of the road leading from May's Lick to Maysville. It is not far from the historic Washington, made famous by Harriet Beecher Stowe in "Uncle Tom's Cabin." It is in the Algonkin linguistic area. The land is rolling, and cut by numerous creeks which discharge into the north fork of the Licking River and so their waters eventually reach the Ohio. These streams cut through nearly horizontal strata of the fossiliferous limestone of the Ordovician (Lower Silurian). The Fox Farm lies on Lower Maysville and Upper Eden, formerly supposed to be about the equivalent of the Lorraine and Utica of the New York series. The Eden consists of shale and thin limestones, the latter of which tend to slip out on the surface of the steep hillsides under the action of frost and rain. Many of these are carried by water some distance down stream, and in places are deposited in such a way as to resemble a pavement, each piece standing on edge, but leaning down stream. The Eden outcrop is always marked by steep slopes and a relatively poor soil; the overlying Maysville, however, gives rise to good soil. Many of these slabs of limestone were carried by the prehistoric people of this vicinity to the top of the high land lying between the streams and there used in the construction of graves. There are numerous salt springs in the neighborhood which in early historic times and before, were visited by deer and other animals for the purpose of licking the salt deposited about their edges. Consequently, many of the names of the nearby villages terminate in the word "Lick." The country was heavily wooded and timber was so common that even at the time of our work there (1895) rail fences could be seen which contained rails of the now valuable black walnut.

A large prehistoric village site, a number of graves, and mounds situated on the higher part of this farm near three natural sink holes where the underlying lime rock has dissolved have been known for many years. While Prof. Cyrus Thomas,¹ refers to an enclosure known as "Fox's Fort," probably one of the sink holes, three miles northwest of May's Lick, which was reported to him by Mr. Gerard Fowke, no full account of them has been published, nor are there in any publication illustrations and descriptions

¹ Thomas, p. 98.

characterizing the culture of the people who formerly lived there. Specimens have been collected on the surface of this site, especially by Mr. Gerard Fowke and by Col. Frederick H. Bierbower of Maysville as well as by casual visitors to the place. A considerable collection from this site may be seen in the Museum of the Public Library at Maysville.

During June, July, and August, 1895, I made a series of explorations on the Fox Farm and a reconnoissance of the vicinity for the American Museum of Natural History. Professor Frederick W. Putnam, at that time Curator of Anthropology in the Museum, planned for me to continue these explorations during the subsequent year and to complete them, but no appropriation was made the next year for continuing the work and the American archaeological work of the Jesup North Pacific Expedition engaged my attention during the following years. We have a very large, and judging from the artifacts usually found in the Ohio Valley, a rather complete collection from this place.¹ There is considerable literature regarding the archaeology of the general region and for this reason we may omit a detailed report on this work and attempt a characterization of the culture of the prehistoric inhabitants, especially for comparison with the results of later work in Ohio in a similar culture, carried on by Mr. William C. Mills.²

The age of this village site is unknown. Glass beads, arrow points of iron, iron tomahawks, trade pipes, or similar articles showing evidence of contact with whites were not found. The oldest families in the neighborhood who have lived there for several generations have no knowledge or traditions of anyone having inhabited the place except their own people, or of anyone who made burials there. On the other hand, there is no positive evidence pointing to its great antiquity. The finds have been compared with those made by Mills at the Adena Mound and at the Gartner Mound and village site which are between 66 and 80 miles northeast, as the "crow flies," from the Fox Farm.

The accompanying illustrations of artifacts are from photographs by Mr. William C. Orchard, and show the objects one half natural size, those of field views are from negatives by the writer. The drawings are by Miss Ruth B. Howe. The animal bones have been identified by Dr. W. D. Matthews and Mr. Barnum Brown. Mrs. Fanny E. Fox gave us permission to explore on her land; Dr. Charles L. Metz of Madisonville, Ohio, made arrangements for our explorations and caused preliminary prospecting excavations to be made by several of my former workers; Col. Frederick

¹ Smith, (e).

² Mills, (a), and (b).

H. Bierbower of Maysville, assisted us in various ways, and we were treated most hospitably by Mrs. Fox's family, and the other people of the vicinity. In the field I was assisted by Dr. Cleveland Abbe, Jr., and by Mr. George L. Hamilton. Miss Edith I. Demerell and Miss Bella Weitzner assisted in preparing the manuscript for the press and in reading proof.

New York City,

December, 14, 1910.

RESOURCES IN ANIMAL AND PLANT MATERIALS.

The prehistoric people of the Fox Farm, as indicated by the results of these explorations, depended on a variety of natural products; but no indications were found that they relied particularly upon any one staple resource. Some of the animal and plant materials used are suggested by the specimens, shown in Plates xvii-xix, which were found in excavating in the village site and also in the earth of which the mounds were made, evidently scraped up from the adjacent surface of the surrounding village site.

Food. For food, they could choose from black bear (Plate xvii, Fig. 1), deer (Plate xvii, Fig. 2), elk (Plate xvii, Fig. 3), raccoon (Plate xvii, Fig. 4), opossum (Plate xviii, Fig. 7), woodchuck (Plate xviii, Fig. 8), beaver (Plate xviii, Fig. 9), red or fox squirrel (Plate xviii, Fig. 10), wild turkey (Plate xviii, Fig. 2), duck (Plate xviii, Fig. 3), turtle (Plate xix, Figs. 1-2), and fish (Plate xix, Fig. 3), as shown by the bones of these animals. In the Adena Mound of Ohio, Mills found bones of the black bear, Virginia deer, elk, raccoon, otter, beaver, wild turkey, trumpeter swan, and great horned owl, and incisors of the beaver.¹ In the Gartner Mound, as indicated by the finds of bones and shells, he found black bear, deer, elk, wolf, gray fox, beaver, raccoon, mountain lion, wild cat, Indian dog, muskrat, ground hog, opossum, rabbit, mink, squirrel, wild turkey, wild goose, trumpeter swan, great horned owl, fresh water drum and mussels.² The remains of seventeen different animals were found in the adjacent Gartner village site among which were the elk, Virginia deer, which constituted about half the large animal bones, black bear, gray wolf, gray fox, mountain lion, wild cat, beaver, raccoon, opossum, mink, muskrat, rabbit, skunk, ground hog, otter, Indian dog, wild turkey which made up

¹ Mills, (a), pp. 12, 20, 23, 25.

² Mills, (b), pp. 8, 13, 28.

eighty per cent of the bird bones, trumpeter swan, wild goose, great horned owl, bald eagle, bittern, fish, box turtle, and mussel.

That fish were used for food here in Kentucky is also suggested by the fish hooks made of bone which were frequently found (p. 187, Plate XXI, Figs. 11-13) and by the impressions of netting on pottery (Plate XXI, Fig. 15). Bones and scales of fish were found by Mills in the refuse pits in the Gartner site.¹ We dug up shells of several species of fresh water clams (Plate XIX, Figs. 4, 5). Mussels were apparently much used for food by the prehistoric people of the Gartner village site,² and beds of them, probably kitchen refuse, like little shell heaps, were found in the cache holes, used as refuse pits.

The charred remains of corn and corn cobs, beans, hickory nuts, and walnuts (Plate XIX, Figs. 6-10), were also secured on the Fox Farm. The corn cobs were small but bore eight and twelve rows of corn while at the Baum site Mills found cobs of eight and ten rows.³ Some pottery bearing impressions such as probably could be made with the large end of a peach pit (Plate LV, Fig. 11) was found here. Mr. H. P. Gould, pomologist in charge of fruit district investigations, of the United States Department of Agriculture informs me that the Department has no historical evidence indicating the existence of the peach in Kentucky in pre-Columbian times, in fact that the species *Prunus persica* to which the peach belongs is not indigenous to this country and, so far as he is aware, all of the closely related species to which the apricots, almonds, etc., belong are also introduced species and were brought to this country, so far as we have any information, in comparatively recent times. He also states that none of the plums they know anything about have large rough pits and in fact, that the native plums, which alone of the plum family could have figured in the pre-white occupation of Kentucky, must have possessed relatively small and comparatively smooth pits as judged by the characteristics of the native plums of the present time. He states that if there was anything in the way of a plum having a large rough pit which could have been used to make the markings on this pottery, it must have been something now lost and unknown even historically, so far as the horticultural varieties and types of plums are concerned. It thus seems that the markings were either not made with a peach pit or that the pottery was made since the discovery of America and the introduction of the peach, but in this case it seems strange that no other evidences of white contact were found. In the Gartner village site, corn on the cob, shelled corn, beans, hickory nuts of three kinds, and wal-

¹ Mills, (b), p. 50.

² Mills, (b), pp. 29-30.

³ Mills, (c), p. 34.

nuts were found in a charred state¹ but there chestnuts and seeds of the pawpaw, butternuts, hazel nuts, and the seeds of the wild plum all in a charred condition were also found.

Materials for Manufacture, Minerals, Stone, Metals, and Clay. For raw material to make tools and other objects, they depended upon stone, clay, bone, antler, teeth, shell, and plant substances. Chert, chalcedony, and jasper were used for chipped points to arrows, spears, knives, drills, and scrapers, as shown by objects made of those materials. Jasper was also chipped into celts (Plate xxxi, Fig. 9). Limestone was chipped into discs (Plate xxii, Fig. 2), pecked into pitted stones (Plates xxxii, Fig. 7), and made into whetstones (Plate xxxiii, Fig. 1), arrow-shaft smoothers (Plate xxxiii, Fig. 5) and pipes (Plate xlv, Fig. 7). Sandstone was made into whetstones, arrow-shaft smoothers (Plate xxxiii, Figs. 3 and 6), discs, perforated discs (Plate xlv, Figs. 1-6, and 8-18), and pipes (Plate xlv, Figs. 1-3). Slate furnished the material for perforated tablets or gorgets (Plate l, Fig. 1), and for a surface on which to incise pictures (Plate lii, Fig. 8). Pebbles of quartz and other material were made into hammerstones (Plate xxxii, Figs. 1-5), and pecked and ground into celts (Plate xxxi). No gold, silver, copper, iron, galena, or objects made of any of these materials were found although in the Baum site of the same material culture copper was found.² We found no mica here as Mills did at the Adena Mound and the Gartner site of Ohio.³

Clay was used for making pottery which was fashioned into vessels, strainers (Plate xxiii, Figs. 3-4), spoons (Plate li, Fig. 4), pipes (Plate xlv, Fig. 11), discs (Plate xliii, Figs. 9, 10), perforated discs (Plate xliii, Fig. 11), beads (Plate xlviii, Fig. 1), and various modeled forms on the edges of the vessels (Plate liv, Figs. 3-5).

Bone. The bone, antler, and teeth of animals were used as material out of which to make various objects, and their skins no doubt were employed in making garments and other useful things. The following species were represented by the remains found: the black bear (Plate xvii, Fig. 1), Virginia deer (Plate xvii, Fig. 2), elk (Plate xvii, Fig. 3), wolf, raccoon (Plate xvii, Fig. 4), red fox (Plate xvii, Fig. 5), lynx or wild cat (Plate xviii, Fig. 6), opossum (Plate xviii, Fig. 7), woodchuck (Plate xviii, Fig. 8), beaver (Plate xviii, Fig. 9), red or fox squirrel (Plate xviii, Fig. 10), pack or wood rat (Plate xviii, Fig. 11), mink (Plate xviii, Fig. 12), weasel (Plate xviii, Fig. 13), great blue heron (Plate xviii, Fig. 1), wild turkey (Plate xviii, Fig. 2), duck (Plate xviii, Fig. 3), owl

¹ Mills, (b), pp. 26, 33, 34, 53.

² Mills, (c), p. 21.

³ Mills, (a), p. 11; (b), p. 65.

(Plate xviii, Fig. 4), eagle (Plate xviii, Fig. 5), two species of turtles (Plate xix, Figs. 1, 2), and fish (Plate xix, Fig. 3). The metacarpus and the metatarsus of the deer were made into skin scrapers (Plate xxxiv, Fig. 2), and awl-like implements (Plate xxxiv, Figs. 12-14). Part of the metacarpal bone of the deer was found by Mills in the Adena Mound of Ohio.¹ Large thick bones furnished the material for cylinders and needles (Plate xxxiv, Fig. 17). The ulnae of the elk, deer, bear, and other animals were used to make awl-like implements (Plate xxxv). The tarsometatarsus (Plate xxxiv, Figs. 3, 4), and tibio-tarsus (Plate xxxiv, Fig. 5) of the wild turkey were also frequently used for this purpose. Pieces of bone were made into chisel-like objects (Plate xxxiii, Fig. 7). Artifacts were made out of the penis bone of the raccoon (Plate xlii, Figs. 4, 5, and Plate li, Figs. 10, 11). Bone furnished the material for fish hooks (Plate xxi, Figs. 11-13, and Plate xxxix, Figs. 1-10), and a number of objects of unknown use. Phalanx bones of elk and deer were cut at the large end and perforated through the opposite articular surface for use in a game similar to "ring and pin," or as pendants on clothing (Plate xliii, Figs. 4-7). The astragalus bone of the deer (Plate xliii, Fig. 8) was frequently found and may have been used in gambling or as a buzz. Hollow light bones of birds were made into fifes or whistles (Plate li, Figs. 13-14), perhaps sometimes used as animal calls. Some of them and a few small bones of other animals were cut off in sections for making tubes (Plate xxi, Figs. 8-10), and beads (Plate xlviii, Fig. 2). Fragments of turtle shell were also found in which a perforation had been made (Plate xxxvii, Fig. 10).

The claw core, or terminal phalanx of an eagle was incised (Plate xviii, Fig. 5).

Antler. The tips of antlers were made into arrow points (Plate xxi, Figs. 1-5). Antler was used for making cylinders, both long and short (Plate xliii, Figs. 1, 2, and Plate xxxiii, Figs. 8-10), and a species of celt-like objects (Plate xxxi, Fig. 10, and Plate xxxix, Figs. 11-14). Some large pieces of antler were perforated at one end (Plate xxxvii, Fig. 11).

Teeth. Bear teeth were made into pendants both by perforating through the tip of the root, and by grooving around it (Plate xlix, Figs. 15-18). Teeth of the elk, deer (Plate xlix, Fig. 10) and wolf (Plate xlix, Fig. 11) were also made into pendants by perforation. Beaver teeth were cut off at the back and across the root for use as knives (Plate xxxiii, Figs. 11-14). Bear teeth were cut off at the end of the enamel, for some, at present, unknown purpose (Plate li, Figs. 7, 8).

¹ Mills, (a), p. 10.

Shell. The shell of several species of fresh water clams furnished the material for spoons or scrapers (Plate xxii, Fig. 6), some of which were perforated through the dome (Plate xxii, Fig. 5). Pounded up, they were used in tempering pottery (Plate xxiv, Fig. 1). Shells, at least of *Olivella*, *Busycon*, and *Marginella apicina* from the Atlantic or Gulf Coasts, secured either from neighboring tribes by barter or warfare or by expeditions to the sea were found to have been made into beads (Plate xlviii, Figs. 12-18), pendants (Plate xlix, Figs. 30-35), discs, perforated discs (Plate l, Figs. 8-14), and pins (Plate l, Fig. 16). Small ocean shells were found in the Adena Mound¹ and pieces of ocean shells in the Gartner Mound.²

Plant Materials. The use of plant material, other than for food which has been mentioned, and for fuel as indicated by finds of charcoal and wood ashes, is indicated by the impressions of cord (Plate xxiv, Fig. 6, and Plate xxv, Fig. 3) and netting (Plate xxi, Fig. 15, and Plate xv, Figs. 1, 2), upon the outer surface of pottery. Implements for the gathering of the vegetable fiber used, were not recognized as such, if found.

SECURING FOOD.

Hunting, Fishing, Gathering Wild Plant Products, and Agriculture. The implements used in procuring food in this region, as far as illustrated among our finds, were those used in hunting and fishing, such as points chipped from stone or rubbed out of antler, fish hooks of bone, and nets. No objects known to have been used for gathering wild plant foods were found, although it is true that walnuts and hickory nuts in a charred condition were secured. Nor were there any objects known to have served for agricultural implements, in spite of the fact that charred specimens of corn cobs, corn, and beans were not infrequently met with in our excavations, and that the chipped limestone discs (Plate xxii, Fig. 2), and oblongs (Plate xxii, Fig. 4), and the chipped celts (Plate xxxi, Fig. 9), may have been hoes or digging stick points for agricultural work. However, none of these objects, which may possibly have been used in digging and hoeing, bear signs of polished edges caused by use in cultivating the soil. It will be remembered that the large agricultural implements from Illinois, Arkansas, and the adjacent country are often highly polished on the edge from use in contact with sandy soil. Possibly all agricultural work and digging was accomplished in this region with digging sticks. Of course,

¹ Mills. (a), p. 20.

² Mills. (b), p. 14.

many of the points for spears, arrows, and knives, may have been used in warfare as well as for hunting and some of them in various industries or for any of these purposes. The celts pecked and ground out of stone (Plate xxxi, Figs. 1-8), those chipped out of jasper (Plate xxxi, Fig. 9), and those made of antler (Plate xxxi, Fig. 10), the discs (Plate xxii, Fig. 2), and oblongs (Plate xxii, Fig. 4) chipped from limestone, chipped pebbles (Plate xxxii, Fig. 1), and hammerstones (Plate xxxii, Fig. 4), some or all of each class may have served occasionally for or solely as axes or club heads used in hunting or warfare. No grooved club heads or axes were found here (p. 195).

Some of the objects considered as awls may have served as daggers or even as spear points (Plate xxxii, Fig. 14); large pieces of antler as clubs used in hunting or in war. Large pieces of antler perforated at one end (Plate xxxvii, Fig. 11), may have been used as slung shots.

Points chipped out of Stone. For hunting, points for arrows, spears, and knives, chipped out of chert, chalcedony, quartzite and jasper were found. No points ground out of stone were seen, although points for arrows made by rubbing and drilling the tips of antler were frequent.

The various styles of chipped points are shown in Plate xx. It will be noticed that some of these (Figs. 9 and 10) have serrated edges and that the chipping is neither of the most crude nor of the most excellent workmanship found in the Mississippi Valley. The edges of the base and notches of some were rubbed smooth as if from friction on the lashings that held them to their shafts (Plate xx, Figs. 11, 12). Arrow points and a spear point of reddish brown flint were found in the Gartner Mound, triangular arrow points chipped from stone were common at the village site there¹ and a spear head of chalcedony was found in the Adena Mound.² No caches of these chipped implements or for that matter of any other class of objects, were found here in Kentucky.

Manufacture of Points chipped out of Stone. The extensive manufacture of chipped points apparently did not take place at this site, although a few chips and flakes as well as very roughly chipped pieces of stone, such as might well be termed rejects, were collected and the method of manufacture is somewhat illustrated by a series of specimens which may be selected from the objects found on the farm (Plate xxxviii, Figs. 1-7). Although, as previously mentioned, it does not seem probable that many chipped points were made here, yet fragments of stone were found which when fresh from the quarry and consequently still containing their quarry

¹ Mills, (b), pp. 15, 20, 37.

² Mills, (a), p. 17.

water would have been suitable raw material (Plate xxxviii, Fig. 1). The hammerstones (Plate xxxviii, Fig. 2; Plate xxxii; and p. 196), were probably used for breaking these pieces into suitable form and roughly chipping them. Chips, the refuse from this process, were also found (Plate xxxviii, Fig. 3). The points roughly chipped into form, but not finished and then lost or rejected because of some fault in the material or accident in chipping, were also found as shown in Plate xxxviii, Fig. 4. The fine flaking which completed the work was probably done with a flaker made of bone or antler which may have been buried in ashes or otherwise treated so as to remove the greasy animal matter and make it less liable to slip in the process. The bone and antler cylinders (Plate li, Fig. 15; Plate xxxviii, Fig. 5; Plate xxxiii, Fig. 9; Plate xliii, Figs. 1, 2; p. 198) may have been used as flakers. The fine flakes made by this process with those or similar flakers were also found (Plate xxxviii, Fig. 6). The finished points (Plate xxxviii, Fig. 7; Plate xx) complete the series.

Points rubbed out of Antler. Points for arrows made from the tips of antler were comparatively numerous. Typical specimens of these are shown in Plate xxi, Figs. 1-5. They were probably for use on arrows, or possibly on spears. Arrows with similar points collected in the eighteenth and first part of the nineteenth century, supposedly from the Indians of Southeastern United States, have been described by Mr. Charles C. Willoughby,¹ who states that they were used from Maine to Arkansas. Such points were found in the Adena Mound² and were more common than points chipped from stone in the Gartner village site.³ These are further discussed under the consideration of fish spears. Points somewhat similar to these but made of phalanx bones of the deer are common in the Gartner village site.⁴ The spatulate objects shown in Plate li, Fig. 16, and the points apparently broken from similar objects shown in Plate xxi, Figs. 5, 6, were possibly used as spear points.

Manufacture of Points rubbed out of Antler. The manufacture of points rubbed out of antler is also suggested by specimens found⁵ (Plate xxxviii, Figs. 8-21). Prongs (Plate xxxviii, Fig. 8), broken from antlers were quite common. Some of the prongs broken off had been cut around or part way around (Plate xxxviii, Figs. 10, 11) apparently with a flake of stone (Plate xxxviii, Fig. 9), in order that the tip out of which to make an arrow point might be readily broken off. Pieces, from each of

¹ Willoughby, pp. 431-437; Cf. Skinner, pp. 14, 21.

² Mills, (a), p. 27.

³ Mills, (b), p. 41.

⁴ Mills, (b), p. 41.

⁵ Cf. Willoughby.

which a tip had been removed by grooving and breaking, were numerous. They were irregularly broken off from the antler at their large end and show signs of the groove around their smaller end where the tip had been broken off after being cut around. Such pieces (lower part of Fig. 12, Plate xxxviii) were naturally more numerous than the tips broken from them; but tips (upper part of Fig. 12, Plate xxxviii) were also found and showed at their bases where they had been cut around and broken off. Some were found not yet sharpened, but drilled at the base (Plate xxxviii, Fig. 17) for the shaft of an arrow or spear, apparently with a chipped drill point such as is shown in Plate xxxviii, Fig. 16. More of them, however, had been whittled with a stone flake (Plate xxxviii, Fig. 9) and sharpened or smoothed (Plate xxxviii, Fig. 15) apparently upon a coarse piece of sandstone (Plate xxxviii, Fig. 14). Still others (Plate xxxviii, Figs. 17, 18), the greater number of the tips found, had been completed by both sharpening and drilling. Sometimes the prong was sharpened before being grooved for breaking. The finished point at one side was somewhat longer than at the other and this side of the base being slightly pointed served as a barb (Plate xxxviii, Fig. 18; Plate xxi, Figs. 1-5). At the Gartner village site every stage of manufacture was represented, even caches of the antler tips were found. There, these were drilled after breaking from the grooved prong and before any other work was done on them. The surplus antler was removed by cutting with a piece of stone.¹ Mills notes concave facets and striations as being proof that the cutting was not done with a steel knife. The final work on the points found at the Gartner village site was done by rubbing them on a fine-grained sandstone.

Snares, Bolas, Calls, and Charms. Some of the bone tubes (Plate xxi, Figs. 8-10), especially those with edges worn smooth, may have been parts of snares and some of the cut and perforated phalanx bones (Plate xliii, Figs. 4-7) mentioned, may possibly but not probably have been for little bolas. The hollow light bird bones and the few small mammal bones cut off at the ends and drilled (Plates li, Figs. 13-14) may have been used as animal calls in hunting. It is possible that some of the perforated discs made of sandstone (Plate xliv, and Plate l, Fig. 2), pottery (Plate xliii, Fig. 11), and shell (Plate l, Figs. 8, 9), the perforated shells (Plate xlviii, Figs. 12-24, and Plate xlix, Figs. 19-33), some of the objects considered as pendants (Plate xlix, Figs. 19-35), the perforated and knobbed teeth (Plate xlix, Figs. 10-11, and 15-18), and the drilled phalanx bones (Plate xliii, Figs. 4-7) of the elk and deer may have been fastened to weapons as charms.

¹ Mills, (b). p. 41; (c). p. 51.

Fish Spears. The points made of antler tips described as arrow points, and in fact some of the chipped stone points may have been used as fish spears. Points made up of three pieces of bone of a form suggesting these antler tips were extensively used on salmon spears on the Northwest Coast of America, where, however, they were detached by the struggles of the fish but were held by lashings to a retaining cord attached to the spear-shaft.¹ Double pointed objects made of the heavy leg bone of an elk or similar animal considered by Mills as awls or spear points were found in the Gartner site.²

Fish Hooks. Fish hooks (Plate XXI, Figs. 11-13) made of bone were used. Some of the hooks (Plate XXXIX, Fig. 8) have a little knob at the tip and others (Plate XXXIX, Fig. 9) have incisions around them. Apparently these knobs and incisions were made to facilitate attachment to the fish line. Fish hooks made of bone were found in the Gartner Mound;³ and less than twelve whole and more than twenty broken, some grooved for the attachment of a line, in the adjacent site. They compare favorably with those found at the Baum village site.⁴ One method of manufacture of such fish hooks was described many years ago by Prof. Frederick W. Putnam in his paper entitled, "The Way Bone Fishhooks were made in the Little Miami Valley."⁵ The methods of manufacture of these hooks, however, are somewhat different and are partly illustrated among the finds (Plate XXXIX, Figs. 1-10).

Several specimens of what appear to be the humerii of turkeys were found (Plate XXXIX, Fig. 1) out of one side of each of which a somewhat rectangular oblong piece had been cut (Plate XXXIX, Figs. 3, 4). Pieces of such thin bone of the size and shape of the above-mentioned pieces were occasionally found (Plate XXXIX, Fig. 5); sometimes these were drilled at each end (Plate XXXIX, Fig. 7) in order to facilitate cutting out the middle portion and making each end the shape of a hook. Some of the fish hooks, by having the general curve and thickness of such a bone, show that they have been cut out of such, and others not completely finished, show the remains of the perforations (Plate XXXIX, Fig. 8). The second method is illustrated by still other fish hooks which show that they were made from the outer surface of a hollow cylindrical bone (Plate XXXIX, Figs. 5-9) apparently by slicing rather than by drilling. One piece of bone or antler (Plate XXXIX, Fig. 10) is rounded at the end, has a scraped groove with a

¹ Smith, (d), pp. 309, 335, 374, Fig. 160, p. 388; Swan, Fig. 4, p. 20; Smith, (c), Fig. 15, p. 148; Teit, Fig. 231, p. 251.

² Mills, (b), p. 48.

³ Mills, (b), pp. 8, 50; (c), p. 70.

⁴ Mills, (b), p. 52.

⁵ Putnam, (a), p. 581.

drilled hole in the middle near that end. It is possibly in process of manufacture into a fish hook. Pieces of bone in every stage of manufacture into fish hooks were found in the cremation ashes of the Gartner mound and the village site.¹ The process² although somewhat similar was different from the two used here on the Fox Farm. There the central part of an oblong piece of bone was dug out instead of being removed by drilling or by slicing off part of a cylindrical bone.

Some of the bone objects considered as awls (Plate xxxiv, Figs. 9–11), among them especially the sharpened splints (Plate xxi, Fig. 14) from deer leg bones may have been used as hooks or barbs for hooks for fishing, and objects considered as pendants such as the perforated bear teeth (Plate xlix, Figs. 15–18), shiny shells (Plate xlviii, Fig. 18), and the shell object shown in Plate L, Fig. 6, may have served for artificial fish bait, possibly on trolling lines.

Nets. Fish were probably caught in nets as is suggested by the impression of netting on fragments of pottery (Plate xxi, Fig. 15), although the mesh of the netting here impressed is very small. The fragment of a bone object (Plate liii, Fig. 4) considered as possibly a scraper may have been a mesh measure. Pebbles notched or grooved on two edges and without battered ends and considered by Mills to be net sinkers were found at the Gartner village site.³

Gathering Plant Food. Celts, pecked and ground out of stone (Plate xxxi, Figs. 1–8), those chipped out of jasper (Plate xxxi, Fig. 9), and those made of antler (Plate xxxi, Fig. 10), and the discs (Plate xxii, Fig. 2) and oblongs (Plate xxii, Fig. 4) chipped out of limestone, or some of each class may have served occasionally or solely as hoes for agricultural work or with the sharp bone objects (Plate xxxiii, Fig. 7), in the securing of bark, or other plant foods or some of them. Pieces of slate with notches or grooves on the sides were frequently found in the Gartner village site⁴ and are considered by Mills to be agricultural implements. Hoes, each made of a thick heavy mussel shell (*Unio plicatus*) with a perforation are common in the Gartner and Baum village sites,⁵ and were found by him in the Adena Mound⁶ but the few specimens found by us (Plate xxii, Fig. 5) are somewhat different from such common shell hoes as I have seen in Ohio and apparently were not used as hoes.

¹ Mills, (b), pp. 8, 50.

² Mills, (b), Fig. 53.

³ Mills, (b), p. 40.

⁴ Mills, (b), p. 40.

⁵ Mills, (b), p. 40; (c), p. 50.

⁶ Mills, (a), p. 12.

PREPARATION OF FOOD.

Knives. Suitably mounted chipped stone points (Plate xxii, Fig. 1) may have been used as knives for cutting up meat and for similar purposes. Discs chipped from limestone (Plate xxii, Fig. 2), of which many were found, a few oblongs also chipped from limestone (Plate xxii, Fig. 4), and pebbles with chipped edges, if not agricultural implements or skin scrapers were perhaps used in like manner. One rather thick specimen somewhat chipped on the thin edge (Plate xxii, Fig. 3), suggests a chopping knife, and may have been used as such. It reminds one of the fish knives made of slate which are used by the Indians of the Northwest Coast and by the Eskimo. The unio, or fresh water clam, of which a number of shells were found having one edge sharpened (Plate xxii, Fig. 6) may have been used as knives. What Mills considers to be knives made of the shoulder blade of the deer and elk or of the posterior portion of the metapodial bone of the deer were found in the Gartner site.¹

Pestles and Mortars. No pestles or mortars were seen by us, although it is known that they were frequently found in the region, pestles being common in every part of the Gartner village site and mortars made of large slabs of sandstone being found there.²

Cooking. Meat was probably roasted before open fires. Charcoal (Plate xxiii, Fig. 1) and ashes were frequently found. There must have been another method of preparing meat as is indicated by the great number of potsherds (Plates xxiv-xxx and Plates liv-lix) found, most of which seem to be parts of broken cooking dishes rather than of ceremonial or water jars. Many of these fragments of pottery have soot (Plate xxiii, Fig. 2) on the outer surface which suggests that cooking was done in pottery vessels over open fires. The little clay dishes shown in Plate li, Fig. 5, are possibly toy cooking pots used by the children. Fragments of pottery vessels the size of a thimble were found in the Gartner village site.³ Some stones covered with soot, others cracked and appearing like stones that have been heated and dropped in water, were found in excavating. These remind us that boiling may have been done in pottery vessels or even in baskets or boxes by adding hot stones. However, they are probably the stones used as pot props or the results of baking roots or vegetables covered with leaves by building a fire on top of them. This process, of course, burns the pebbles nearby.

¹ Mills, (b), p. 49.

² Mills, (b), p. 34.

³ Mills, (b), p. 35.

Pottery. One whole bowl of pottery and many fragments were found. Most of the ware was of a brownish color but a few pieces were coated with a reddish layer which is thicker on the outside. A very few pieces were polished. Pottery was found by Mills in the Adena Mound¹ and was common in the Gartner site.² A pottery jar was found in the Gartner Mound.³

Manufacture of Pottery. The manufacture of pottery is somewhat illustrated by the specimens shown in Plates xxiv-xxx. The clay was probably obtained in the neighborhood. For tempering material, fragments of shell were used. The piece of pottery shown in Plate xxiv, Fig. 1, has been split and exhibits the fragments of shell used in tempering it. The particles of stone found in the pottery were apparently accidentally taken up with the clay and not added as tempering material. The little ball of burned clay or pottery showing finger nail impressions, illustrated in Plate lv, Fig. 2, may be a bit of the raw material for pottery-making which was accidentally or purposely fired. Pottery found in the Gartner village site⁴ was tempered with crushed shells, quartz, quartzite, and pebbles. Clay mixed with broken quartz pebbles and broken shell ready to be made into pottery was sometimes found in a niche in a grave near the head of the skeleton in the Gartner Mound⁵ where in several instances a large mussel shell and sometimes an awl, in others, small river pebbles varying in diameter from two to three inches, were found with the clay. The next specimen shows how some of the ware was cracked in firing, but most of it, as may be seen (Plate xxiv, Fig. 2) by a reference to the other specimens, was more successfully fired. Fragments of charcoal (Plate xxiii, Fig. 1) were frequently found. Some of these may be the results of fires used in firing the pottery. Burned patches of ground were also discovered which may have been the sites of this process. That the pottery was fired in more or less open fires is suggested by the mottled or irregularly burned surface of the ware. The quality of the ware varied somewhat from that of a rather fine surface to some of rough finish (Plate xxiv, Fig. 3).

Many of the fragments found are portions of rims. The specimen shown in Plate xxiv, Fig. 4, illustrates such a rim with a punched perforation probably made to facilitate suspending the pot. The perforation in the next specimen, also a fragment of a rim, was drilled while the perforation through which the following fragment was broken is larger and was apparently modeled.

¹ Mills, (a), p. 11.

² Mills, (b), p. 34.

³ Mills, (b), p. 10.

⁴ Mills, (b), p. 35.

⁵ Mills, (b), p. 10.

Traces of the method of shaping pottery are shown in the specimens illustrated in Plate xxv. The first bears impressions of fine netting which was perhaps wound on a paddle used in patting the outer surface of the vessel. This may have been done to shape the pot or to roughen the outer surface. The next shows the impression of a somewhat coarser netting and the size of the mesh and knots may be clearly seen. There seems to be no lapping of impressions on this fragment which suggests that perhaps they were made by the net used in lifting or holding together the unfired vessel, instead of by a paddle wound with the netting. Fig. 3 of this plate shows the impressions of twisted cord where they lap and run at different angles showing that they were made by a cord-wrapped paddle. According to Mills, cord-wrapped paddles were used at the Gartner village site.¹ In Fig. 4 of the same plate, the impressions of cord have been partly smoothed down before the vessel was fired. The next fragment shows lines, apparently modeled on the clay to represent cord markings; while Fig. 6 of this plate shows the impressions of a carved paddle, probably made of wood.

The method of attaching the loop handles to the pots is illustrated by some of the specimens found. Apparently the handle was modeled separately from the pot and had a knob or projection on the upper end to be inserted in a depression made in the vessel near or at the rim. The handle was then attached by smearing or modeling the clay of both ends to the vessel. At the Gartner site practically all the larger vessels had handles, modeled and put in place after the vessels were formed.² Mills states that these were attached by piercing the vessel and inserting a small plug of clay which was expanded on the inside. On the outside, the handle was molded to this plug. The fragment of a pot rim shown in the next figure shows how the upper edge of the vessel was sometimes folded over to form the rim. This specimen also bears a small knob or lug. The next figure illustrates a small piece of rim bearing a little lug, the middle of which is concave. Such lugs were not frequently found. The next specimen bears a lug made up of two horizontal ridges.

Handles of various forms are shown in the remainder of the plates (Plates xxvi-xxx). All these handles may be considered to be developments of two knobs or nipples as shown in the first figure. About a third of them appear to have been developed by the union of the lower parts of these knobs as in the second figure. A specialization or more intense development of this type of handle is shown on the other fragments of rims on this plate, and attempts at decoration may be noticed in Figs. 5, 8 of

¹ Mills, (b), p. 35.

² Mills, (b), p. 35.

the same plate where the notches made with the tip of the finger and showing the imprint of the finger nail also have been made on the top of the ridge. In lifting a vessel provided with such lugs as these it would seem that the thumb would be placed above the lug and the fingers would lift on its lower side.

Perhaps another third of the handles were developed from a union of the upper part of two knobs or projections on the rims of the pots as illustrated in Plate xxvii. The first specimen shows two knobs somewhat elongated vertically. In the second, the rim is slightly enlarged and tends to connect the upper parts of the knobs, while in the third and fourth there is a perceptible ridge in line with the rim and connecting the two parts of the lug. The remaining specimens shown in this plate illustrate the range of forms and specialization of handles of this type. This form of handle was found at the Gartner village site.¹ In lifting vessels bearing this type of handle it would seem that the forefinger might rest in the concavity below the bridge over the top of the lugs or that the fingers might find gripping places below the entire lug. The form of the last specimen may possibly be interpreted as a crude representation of an animal.

A variety of handles is shown in Plate xxviii. The first and second may be considered to be an extreme development of the type of handle shown in Plate xxvi, where the lower part of the lug is hardly below a level with the lower part of the rim. If this type of lug is still further developed it becomes a horizontal ear like that on the fragment of rim shown in Plate xxviii, Fig. 3. In this case, the lug is slightly below the top of the rim, while in the next figure it is level with the rim and seems to be decorated with a little knob on the top. Specialized lugs of this type are shown in the remaining figures on this plate. One represented by Fig. 5 has an incision down its middle, while the one shown in Fig. 6 has a vertical incision near each end. Fig. 7 shows such a lug with several incisions. If we consider that such a lug, as for instance the one shown in Fig. 8, is still further developed by being elongated and attached to the vessel lower down, we have as a result the type of loop lug or handle shown in Plates xxix and xxx.

More than a third of all the pottery handles found are of this loop form. The method of attaching this type of lug has been discussed on p. 191. They vary in size and somewhat in shape as shown in the plates. The first is nearly a straight band and meets the rim of the body of the jar with a rather acute angle while in the second the lug is more cylindrical in form and is rounded out so that it forms almost a semi-circle, to which the body of the

¹ Cf. Mills, (b), Fig. 29a.

jar would be a diameter. Fig. 3 of the same plate shows a lug which is much wider at the top than at the bottom and the rim is marked by transverse incised lines or notches. While the rim above the lug in the last figure in this plate may be considered as developed from such notches it shows large even smooth scallops. The lugs shown in Plate xxx show considerable specialization. The first bears a series of dots, apparently for decorative purposes. The second, has an unusually protruding rim at each side of the top of the lug. The fifth shows a lug of this character, but one having practically no opening between it and the body of the jar. The sixth bears rows of impressions apparently for decorative purposes, while the seventh not only has two nipples on the rim, one on each end of the top of the lug, but is also depressed longitudinally down its middle in such a way that it slightly resembles the lug shown in Plate xxvii, Fig. 8.

Before the pottery was fired the rims and handles were often ornamented and designs were incised upon the pottery apparently for decorative purposes. These incisions were possibly made with some of the bone implements such as those described on p. 201 and shown in Plate xxxiv, Figs. 3-15, and Plate xxxv. One piece of pottery was painted (Plate liv, Fig. 11). The modeling, incising, and painting of pottery are mentioned under the section of art.

Strainers. Fragments of strainers made of pottery were found. In some of these (Plate xxiii, Fig. 3) the perforations have been made by punching from the inside before the vessel was fired; in other cases (Plate xxiii, Fig. 4) the holes have been drilled from without after sun drying or firing. It will be remembered that both punched and drilled perforated pottery strainers are found in the cliff-dwellings of the Southwest and that the holes are sometimes arranged in designs such as circles and crosses.

Spoons. Spoons are suggested by the number of fresh water clam shells found to be somewhat rubbed across the edge opposite the hinge apparently by scraping against the bottom and sides of rough pottery dishes. I have seen modern Indians at Victoria, British Columbia, using clam shells in this way. The pottery object shown in Plate li, Fig. 4, may be a spoon or ladle.

Forks. Some of the objects considered as awls (Plate xxxiv, Figs. 3-7, and Plate xxxv) may have served as forks. Mills also considers that the awls made of the tarsometatarsus of the wild turkey as well as the "effigy" awl carved to represent the head of a fox or some closely allied animal, and large awls made of bone found in the Gartner village site served for forks as well as awls.¹

¹ Mills, (b), p. 47.

Succotash. Charred masses of a mixture of corn and beans were often found and this suggests that these two foods may have been prepared as succotash (Plate XIX, Figs. 6, 8).

HABITATIONS.

No remains of habitations were discovered. The several oblong or rectangular depressions mentioned on p. 177 were natural sink holes, the results of the caving of the earth above caverns formed by the solution of the limestone below. The village refuse in and near them was much less plentiful than in other places. It seems altogether likely that the habitations used by these people were such as to leave no very marked depressions or signs other than the great abundance of village refuse in certain places as compared with the usual amount which was found scattered about the surface of the farm. It is true that in several places this refuse was collected to form the mounds which I did not consider the remains of habitations, but rather simple coverings to a number of graves.

Caches. Caches of implements¹ roughly chipped from chalcedony and jasper were numerous in the Gartner village site and caches of antler tips² were also found there. It seems probably accidental that we found no such caches here.

Mats. Mats for shelters and beds, floor mats, and food mats were perhaps made by weaving or sewing together cat tail stalks or tulies, although no long needles suitable for sewing such material were found. It is quite possible, however, that needles were made of wood and long since disintegrated or that some of the awls were used for that purpose, the thread or twisted cord such as is shown by the impressions on the pottery, being pushed through by the fingers.

TOOLS USED BY MEN.

A number of artifacts considered to be tools were found. Among these, celts, hammerstones, whetstones, arrow-shaft smoothers made of stone, chisel-like bone objects, antler pins, and cylinders, beaver-tooth knives, chipped knives, flakes, and drill points are considered as having probably been used by men.

¹ Mills. (b), p. 39.

² Mills. (b), p. 42.

Celts made of Stone. Stone celts were occasionally found. The forms of these are shown on Plate xxxi, Figs. 1-9. All were of the general types common to the Mississippi Valley. The celts shown in Plate xxxi, Figs. 2, and 5-7 are broader at the edge than at the poll. The side edges and poll of some of these tend to be more or less flat. The surfaces of the sides and the outline of the cutting edge are convex. Some (Plate xxxi, Figs. 1-3, 7-8) are symmetrical, that is, sharpened about equally from each side; others (Plate xxxi, Figs. 4-6) are sharpened from one side more than from the other. A few (Plate xxxi, Figs. 5-6) seem to have slight notches in the side edges, possibly made to facilitate hafting or caused by hafting them. Most of the celts were made of tough granular stone, were pecked into shape and then polished. A few were chipped (Plate xxxi, Fig. 8) before being pecked. The polishing was not sufficient in some cases to obscure the marks of pecking (Plate xxxi, Figs. 2, 8). Some of the celts, however, were made of jasper and chipped into form. One of these shown in Plate xxxi, Fig. 9, is double edged or double bitted and has a more or less straight asymmetrical cutting edge. Part of the lower cutting edge has been formed by grinding and polishing and the side edges are rubbed smooth. Those celts formed by chipping and grinding are much more scarce than those formed by pecking and polishing, not only on this farm, but if not in the whole Mississippi Valley, at least in the greater part of it. One of the double bitted ground celts made of yellowish sandstone is very small and may be a whetstone instead of a celt. An object described on p. 197 as having been used as a hammerstone was no doubt first a celt made by pecking and polishing. It appears to have been a symmetrical celt. Celts made of stone were found in the earth of the Gartner Mound and in every part of the Gartner village site. One found in a grave was finely polished. Although none were grooved, many were pecked for the attachment of a handle.¹ According to Mills, they were found there in all stages of manufacture. In some cases pecking had been begun only on a small surface of a pebble of suitable form, in others it had been completed. The same was true of the subsequent grinding. No grooved axes were found by us on this Kentucky site and Mills found only two at the Baum site.²

Some of the thin oblong pieces of limestone chipped on the edges (Plate xxii, Fig. 4), and in fact, the numerous flat discs of limestone, roughly chipped to a cutting edge around their entire circumference (Plate xxii, Fig. 2) may have been used as celts, but they show no polished or worn edges.

¹ Mills, (b), pp. 13, 39, 62.

² Mills, (c), p. 42.

Celts made of Antler. Celts made of a slab of antler and asymmetrical, being sharpened rather more from the inner side than from the natural surface (Plate xxxi, Fig. 10), were found. They are broader towards the cutting edge than at the poll.

Manufacture of Celts made of Antler. The history of the manufacture of these celts is suggested by a number of specimens, several pieces of antler (Plate xxxix, Fig. 12) were found which had been cut along the sides in such a way as to form a V-shaped groove which was apparently made with some such object as a stone flake (Plate xxxix, Fig. 11) or a chipped stone point and for the purpose of working through the stronger outer part of the antler so that a slab or section might be broken out. These sections lying between such grooves compare approximately in size to the celts made of antler and if broken out carefully would furnish material for their manufacture. These slabs might then be rubbed into shape and sharpened to an edge on a piece of sandstone (Plate xxxix, Fig. 13). This work might obscure all signs of the grooving (Plate xxxix, Fig. 14); but the celt shown in Plate xxxi, Fig. 10, has grooves on each side edge apparently by means of which it was cut out. Large celts made of elk antler were found at the Gartner village site.¹ Mills also mentions scrapers in a way indicating this class of objects. He states that few "scrapers" made from the antler of the elk were found in various parts of the site; some were sharpened at both ends and these were longer than those sharpened only at one end which latter were probably provided with a handle. A few of these have notches cut on the side edges.² No notched celts were found by us on the Fox Farm. Scrapers made from the heavy metapodial of the elk were found in the Gartner village site.³ According to Mills, they were made like the scrapers of antler and were probably hafted in wooden handles (p. 198).

Hafting and Use. These various celts were probably hafted and used in carpenter work as axes and adzes, but they may have been used in securing food by hunting, or in warfare as mentioned on p. 184, or even as agricultural implements. Those of stone pecked and polished, might have been hafted by winding a withe about them or by fitting them into a hole in the side of a fairly large handle. The thin celts chipped from jasper, and celt-like pieces of limestone, may have been used in the same ways, but the latter seem better adapted for use as skin scrapers or as agricultural implements.

Hammerstones. There are two kinds of hammerstones, simple and pitted. Typical specimens of both are shown in Plate xxxii. Simple

¹ Mills, (b), p. 37.

² Mills, (b), p. 43.

³ Mills, (b), p. 45.

hammerstones consist of pebbles or masses of rock showing more or less extensively battered and sometimes chipped surfaces on their ends or entire circumference (Plate xxxii, Figs. 1, 2) and sometimes are faceted (Plate xxxii, Fig. 3). These are apparently simple or less specialized forms of the pitted hammerstones, perhaps such as were used only temporarily or only for pounding and never as an anvil. One specimen is apparently a celt which has been used as a hammerstone until both poll and edge are very blunt.

The pitted hammerstones consist of pebbles or blocks of somewhat water worn stone which were more or less pecked on the middle of either side, apparently for the reception of the thumb upon one side, and the middle finger on the other to facilitate holding the object as a hand hammer. One specimen (Plate xxxii, Fig. 6) has two such pits on each side. One or both ends, one or both side edges and sometimes the entire circumference of such hammers are battered from use in pounding. No carved hammers made of stone were found.

These hammerstones were probably used in flaking stone for the manufacture of chipped points, driving stakes, pounding meat, cracking nuts, as anvils or for several such purposes. Hammerstones were abundant in the Gartner village site.¹ Some were battered on one end, others on both.

Pitted Stones. Pieces of limestone or sandstone bearing one (Plate xxxii, Fig. 7) or several pits were occasionally found. The pits are usually about an inch and a half to two inches in diameter by perhaps three quarters of an inch deep and appear to have been pecked into form. The use of pitted stones has long been conjectural. A large piece of sandstone with pits on both sides was found by Mills in the Adena Mound.²

Whetstones. Fragments of sandstone and even of gritty limestone worn flat or concave upon one side were found (Plate xxxiii, Fig. 1). These were evidently whetstones for shaping and sharpening various tools. Undoubtedly the stone celts were sharpened by rubbing them upon such grinders. Very likely they were used in sharpening animal bones and antler that were to be used for awls, arrow points, and for similar purposes. In fact, they may have been used in grinding and shaping some of the smooth and flat objects made of shell. One (Plate xxxiii, Fig. 2) is of celt shape. Other grinders have one or more V-shaped grooves extending across them. These (Plate xxxiii, Fig. 4) were apparently also used for sharpening the tips of arrow points made of antler, awls made of bone, etc., although some of the cuts in the stone are rather too sharp to have been so formed. Whetstones of fine grained sandstone, some finger-shaped pieces used upon

¹ Mills, (b), p. 40.

² Mills, (a), p. 9.

all sides, others symmetrically cut with edges and sides smoothed, but the majority flat, with grooves probably caused by sharpening bone needles and awls and by the manufacture of shell objects, are common in the Gartner site.¹ One whetstone made of sandstone was found in the Adena Mound.²

Arrow-shaft Smoothers. Sometimes pieces of sandstone which may have been used as whetstones, being flat upon one or more sides, have one or more grooves semicircular in cross section. These (Plate xxxiii, Figs. 3, 6) were probably used in smoothing and straightening arrow-shafts, or in smoothing the bone and antler cylinders, such as are shown in Plate LI, Fig. 15; Plate xxxiii, Fig. 9; and Plate xliii, Figs. 1, 2. The two fragments shown in Plate xxxiii, Figs. 5, 6, resemble the semi-cylindrical arrow-shaft smoothers of the Northwest plateaus. The groove in the first seems rather sharp for such a purpose. It may be unfinished or intended to become more semicircular in section by use.

Chisels of Bone. Objects resembling chisels made of fragments of bone especially of the metatarsus of the deer were occasionally found. These may have been used in wood working³ or possibly as skin fleshers or grainers.

Pins and Cylinders of Antler and Bone. Pin-shaped objects of antler (Plate xxxiii, Fig. 8) and bone, one of them (Plate xxxiv, Fig. 10) having an incision setting off a knob of bone and head and cylinders of antler (Plate xxxiii, Fig. 9; Plate xliii, Figs. 1, 2; Plate LI, Fig. 15) may have been used as tools if not in games discussed on p. 209. Possibly the cylinders may have been flakers. The large section of antler with rounded ends and having a natural ridge scraped smooth shown in Plate xxxiii, Fig. 10, may also be a flaker or it may be an unfinished knife handle.⁴ Such handles were found in 1884 at the Turner Group⁵ in the Little Miami Valley, Ohio,⁶ which is not far from Mason County, Kentucky. In the interior of British Columbia antler knife handles are sometimes boiled to soften them so that the knife blade may be driven in easily after which the antler becomes as hard as ever.⁷

Knives made of Beaver Teeth. The lower incisor of the beaver is sometimes cut off across the base by grooving and breaking, and a portion of the inner surface is grooved out longitudinally (Plate xxxiii, Figs. 11-13),

¹ Mills, (b), p. 59.

² Mills, (a), Fig. 21, p. 22.

³ Cf. p. 196.

⁴ Cf. also Plate LI, Figs. 9, 12.

⁵ The Turner Group finds belong to the Hopewell Culture, however, while the Fox Farm remains are of the Fort Ancient Culture. See p. 233.

⁶ Putnam, (b), Figs. 8, 9, p. 457.

⁷ Smith, (c), p. 166.

or cut off flat (Plate xxxiii, Fig. 14). Two of these last were found. The first two have the left side of the cutting edge broken away as if to narrow it. The last has a groove across the base. All these may have been used as points for knives suitable for wood carving. Such knives hafted in wooden handles are used as chisels in making snowshoes and also as crooked knives by the Eastern Cree.

Chipped Flakes. Some of the sharp stone flakes (Plate xxxiii, Fig. 16; Plate xxxvi, Fig. 7) and the chipped points may have been used as knives. The edge on one (Plate xxxiii, Fig. 15) is rubbed smooth, possibly from such use. Objects of stone (Plate xxxvi, Fig. 8), pottery (Plate xxxvi, Fig. 9), shell (Plate xxxvi, Figs. 10, 11), bone (Plate xxxvi, Figs. 12-16), teeth (Plate xxxvi, Figs. 17, 18), and antler (Plate xxxvi, Figs. 19-21) bearing cuts are mentioned on p. 206.

Chipped Drill Points. Slender chipped points of stone such as those shown in Plate xxxiii, Figs. 17-19, and Plate xxxvii, Fig. 12, were probably used as points for drills. Some of them have wide tangs, others have bases but little less acute than the point. These were probably hafted in the split end of a cylindrical shaft. The drill may have been revolved between the palms, the palm and the thigh, by means of a bow or with a pump drill attachment. Such points make a tapering hole such as may be seen in a large number of objects found here. Among them are some made of stone (Plate xxxvii, Figs. 1-2), pottery (Plate xxxvii, Fig. 3), shell (Plate xxxvii, Fig. 4), bone (Plate xxxvii, Fig. 5), teeth of bear (Plate xxxvii, Fig. 6), wolf (Plate xxxvii, Fig. 7), deer (Plate xxxvii, Fig. 8), elk (Plate xxxvii, Fig. 9), and shell of the turtle (Plate xxxvii, Fig. 10).

No hollow reeds or other drills corresponding to our diamond drill were found, unless we may consider some of the bone tubes, shown in Plate xxxvi, Figs. 13, 14, as having been used for this purpose, but they certainly show no signs of such use. We did find a single specimen, a fragment of a pipe (Plate xxxvii, Fig. 13), showing drilled holes which left a core such as would result from drilling with a hollow drill, and we also found a number of specimens with holes having parallel sides, such as may have been drilled by this process (Plate xxxvii, Fig. 11). The method of manufacture of certain objects involving the process of drilling is again mentioned on p. 206.

TOOLS USED BY WOMEN.

Tools supposed to have been used by women other than those employed in the preparation of food are shown on Plates xxxiv-xxxv. They include scrapers, awls, and needles.

Scrapers chipped out of Stone. A few of the less acute chipped points of stone may have been used as small skin scrapers. The one shown in Plate xxxiv, Fig. 1, made of pinkish chalcedony is rubbed smooth across the edge as are the chipped stone skin scrapers of the Thompson River region in the southern interior of British Columbia. The latter, however, are much larger.

The chipped discs of limestone shown in Plate xxii, Fig. 2, and the chopping knife of limestone (Plate xxii, Fig. 3), as well as the oblong also chipped from limestone (Plate xxii, Fig. 4, pp. 188, 189, and 195), may have been inserted in the split end of a stick and used as a skin scraper similar to those employed in the Thompson River region.¹ However, such skin scrapers are polished across the edge from use, while none of these discs show signs of wear.

Scrapers made of Bone. Scrapers and fragments of such objects made from the metatarsal or metacarpal bone of the deer (Plate xxxiv, Fig. 2) were frequently found. The middle portion of the posterior surface of this bone was grooved out almost to the end, being cut through to the marrow canal in such a way that along about one third of the length of the bone at the middle a sharp edge is formed where the grooving cuts off the outer part of the sides of the bone. This portion of the implement would serve as a skin scraper. Such scrapers are found in the Thompson River region² and I have seen the Thompson River Indians scrape skin with part of an old scythe blade about the length of one of these skin scrapers. The ends of the scythe blade were wound with rags to protect the hands and to form convenient handles. Similar objects³ made of horse ribs, wound at the ends with sagebrush and rags and used for the same purpose were collected from these Indians by Mr. James Teit. The fragment of a bone object with little pits drilled in one end (p. 188, Plate LIII, Fig. 4) may have been used as a scraper. Scrapers, made of the metapodial bones of the elk and deer were found by Mills in the cremation ashes in the Gartner Mound.⁴ Broken pieces of these were found in various parts of the mound but only a

¹ Teit, Plate XIV, Fig. 1; Smith, (a), Fig. 64.

² Smith, (a), Figs. 65, 66; (b), Fig. 356.

³ Teit, Figs. 128, 129.

⁴ Mills, (b), p. 8.

few of them in the cremation ashes. Scrapers made of the shoulder blade of the deer were occasionally found in the Gartner village site and some made from the shoulder blade of the elk were found but the unworked bones were rarely seen.¹ The celt-like objects made of antler mentioned on p. 196 (Plate xxxi, Fig. 10; Plate xxxiv, Fig. 14), may have been used by the women in scraping skins, as also may the bone chisel shown in Plate xxxiii, Fig. 7.

Manufacture of Scrapers made of Bone. The history of the manufacture of one of these scrapers is illustrated by some of the specimens. The natural metatarsal and metacarpal (Plate xl, Fig. 1) bones of the deer were found. The grooving was perhaps done with flakes of stone or chipped stone knives. This is suggested by numerous scratches at the ends of some of the grooves such as would be made by the slipping of a tool. Plate xl, Fig. 2, shows a chip such as may have been used in cutting them, Plate xl, Fig. 6, a sandstone such as may have been used in grinding them to a sharp edge. Plate xl, Fig. 3, illustrates such a scraper broken as from use. A few entire and many broken scrapers made of the anterior and posterior metapodial bones of the deer and elk were found throughout the Gartner village site. The natural bones were rare, nearly all of them being broken, made into scrapers, or in process of being made into them. Mills believes a blunt flint implement was used in making these scrapers.²

Awls. Awls made of bone were among the most common finds. The range of forms and sizes is illustrated in Plate xxxiv, Figs. 3-15, and Plate xxxv. They were probably used in making holes in buckskin and similar material in order to sew moccasins and other garments. Some may have been used in making baskets, weaving nets, decorating pottery or even as forks for the preparation of food, although it would hardly seem likely that they were used in eating. Some of them, especially the long ones, may have been used as spear points or daggers in hunting or warfare and the smaller specimens may have served as fish hooks or barbs for large hooks. It is possible that the notches considered to be for decorative purposes were intended to facilitate fastening these pointed bones to some sort of handle or fish hook. The points of some of them are polished by use, others are polished throughout their entire surface probably by long handling.

One of the most numerous types is shown in Plate xxxv. These awls are made of the proximal end of an ulna, or in the case of the one shown in Plate xxxv, Fig. 4, are shaped so that they resemble other awls made of that bone. The articular end or the part shaped like it forms a convenient

¹ Mills, (b), p. 43.

² Mills, (b), p. 43.

handle. Fig. 1 illustrates one made of the ulna of a young elk which has simply been sharpened at the slenderer end. An awl made from the ulna of an elk but with the expanded portions removed was found in the Gartner village site.¹ Fig. 2 illustrates one of this type of awl made of the ulna of a deer, the animal whose ulna was most frequently used, and it resembles in every way the awls made of the corresponding bone of the elk just described. Fig. 3 illustrates one which has not only been sharpened, but has lost the epyphysis and the sutural surface has been rubbed smooth. This probably is the case only in awls made from bones of young animals. It is highly polished. Awls, always with acute points, made of the ulna of the deer were found in every part of the Gartner village site.² Sometimes these bones in their natural condition without having been sharpened (Plate XL, Fig. 7) were found and it would seem that such a natural bone could be made into an awl (Plate XL, Fig. 8) in a few moments by roughly rubbing it into shape on a grooved piece of sandstone (Plate XL, Fig. 6) such as were frequently found. Fig. 4, Plate XL, illustrates one of this type, not made of an ulna, but shaped like an ulna. It is cut out of the pubic bone of a black bear. The ulnae of the black bear (Plate xxxv, Fig. 5) and lynx (Plate xxxv, Fig. 6) were also made into awls.

Perhaps the most numerous type of awl is that shown in Plate xxxiv, Fig. 3, made from the proximal part of the tarsometatarsus bone of the wild turkey. The articular end of this bone was used as a handle, the other end being cut off across the marrow canal and sharpened. Sometimes this type of awl was notched apparently for decorative purposes (Plate xxxiv, Fig. 4). Awls made from the tarsometatarsus of the wild turkey were perhaps the most frequently found implements in the Gartner Mound and in the village site, where they were found in the graves, refuse pits, and tipi sites. Some of them are ornamented with notches.³

We found specimens illustrating the method of manufacture of this type of bone awl (Plate XL, Figs. 2, 6, 9-11). This series begins with a natural tarsometatarsus from a male wild turkey (Plate XL, Fig. 9) bearing a spur, and includes a flake (Plate XL, Fig. 2) or a chipped stone point for use as a knife in cutting the bone and a whetstone or grinder (Plate XL, Fig. 6) used for shaping and sharpening it. The notches in those decorated (Plate XL, Fig. 11) could have been made with the flake of stone. This awl was found in every stage of manufacture in the Gartner Mound.⁴

Similar awls were made from the tibio-tarsus of the wild turkey; these

¹ Mills, (b), p. 46.

² Mills, (b), p. 46.

³ Mills, (b), p. 47.

⁴ Mills, (b), p. 8.

were nearly as numerous as the previously mentioned type. Some (Plate xxxiv, Fig. 5) are made from the distal part, perhaps a greater number of the proximal part (Plate xxxiv, Fig. 6). Some of the latter are decorated by notches (Plate xxxiv, Fig. 7). One has a gouged perforation near the base possibly for suspension. The articular ends usually form the handle, but often in those made from the proximal part this surface is cut away.

The history of the manufacture of these two types of common awls from this bone is suggested by the specimens found, some of which are shown in Plate XL. The natural tibio-tarsus bone, a rather small one, probably of a female bird, is shown in Fig. 12. Fig. 14 illustrates an awl made from the distal end while Fig. 13 shows one made from the proximal end, a flake, such as may have been used in cutting the bone, and a grindstone such as was probably used to smooth it are shown by Figs. 2 and 6, respectively. The distal end of the metatarsus or of the metacarpus bone of the deer was occasionally made into awls (Plate xxxiv, Fig. 12; Plate XL, Fig. 4). Sometimes it was cut in two by grooving and breaking so that the two bones which were fused together to make it were separated again and one or both parts were made into awls by sharpening (Plate xxxiv, Fig. 13; Plate XL, Fig. 5). Whether made of an entire or of half an end, the articular surface usually served as a handle. An awl made of half of the distal end of the metapodial bone of the deer was found at the Gartner village site and Mills considers that it may have been made from a broken scraper.¹ In a few cases, however, (Plate xxxiv, Fig. 14) the awl was made of the proximal end which was cut away and smoothed.

The life history of these awls is also suggested by objects found in this site. The natural bone (Plate XL, Fig. 1) was seldom found, but flakes of stone (Plate XL, Fig. 2) such as could have been used to cut it and grindstones (Plate XL, Fig. 6) on which it could be ground to shape, as well as finished awls of both styles (Plate XL, Figs. 4, 5) were frequently found. Awls made from other bones (Plate xxxiv, Fig. 15) were also found and not a few made from fragments of the long bones of quadrupeds (Plate xxxiv, Fig. 8) and birds (Plate xxxiv, Fig. 9) were frequently secured. An awl made of one of the heavy bones of the deer or elk was found in the Gartner Mound.² Awls made of the shoulder blade of the elk and Virginia deer were found in the Adena Mound³ and in the Gartner village site but the elk bone in a natural state was rarely found in the latter.⁴ An awl

¹ Mills, (b), p. 45.

² Mills, (b), p. 19.

³ Mills, (a), p. 24.

⁴ Mills, (b), pp. 43, 47.

decorated with incised lines encircling it near the point and having an enlargement about one quarter of the way back from the point to the base was found in the Gartner Mound.¹ A small pointed object was found here in Kentucky (Plate xxxiv, Fig. 10) which is a sharpened cylindrical piece of the wall of a large bone. It was originally broken off by grooving and is also grooved about a quarter of an inch from the present base. It is probably intended for some kind of an awl. The splint bone (Plate xxxiv, Fig. 11) from the leg of the deer may have been used for an awl. A double pointed awl made from the heavy leg bone of a deer, one made from the tibio-tarsus of a bird, and one made of antler were found in the Gartner site.² Some were beautifully wrought and highly polished. They were also found in the Gartner graves.

Needles. No very fine needles were found but the object made of bone shown in Plate xxxiv, Fig. 17, is apparently a needle with the eye broken out and the penis bone of the raccoon perforated at the distal end (Plate LI, Figs. 10, 11) may have been used as a needle. The highly polished and pointed pieces of long bones of birds (Plate xxxiv, Figs. 9, 16) may be needles in process of manufacture; as too may be the piece of bone or antler partly drilled at one end (Plate xxxix, Fig. 10), all of which were found here.

The bone object shown in Plate LI, Fig. 16, may possibly but not probably have been used as a large netting needle. It is made from the wall of a large long bone of some animal, and has a lanceolate point, cylindrical shaft, and a perforation through its irregular base. Fragments of what may have been the same kind of an object are shown in Plate xxi, Figs. 6, 7, the groove around the broken basal end of the latter may have been to facilitate attaching a thread or cord in an attempt to use it after it was broken. Needles made of bone were only occasionally found, but broken pieces of them were numerous in the Gartner site all of which had a circular eye in the largest end.³ One made of bone was found by Mills in the Adena Mound.⁴

Manufacture of Needles. The history of the manufacture of this object is suggested by a few of the specimens found here. Plate xlii, Fig. 4, shows the natural penis bone of the raccoon; the next specimen is perforated vertically through the tip and the articular knobs of the base have been cut off. The perforating could have been done with a drill point chipped from stone (Plate xlii, Fig. 3) by continuing the drilling until

¹ Mills, (b), p. 16.

² Mills, (b), p. 48.

³ Mills, (b), p. 48.

⁴ Mills, (a), pp. 11, 24.

the point was far through the bone so as not to form a conoid or biconoid perforation. Some of the long bone tubes may have been needle cases.¹

The bone object shown in Plate LIII, Fig. 3, cut out of the shoulder blade of a deer and perforated with fourteen drilled or gouged holes, some of them tapering from one side and some from the other, and all but one arranged so that they form a somewhat M-shaped figure, may possibly have been used as a sewing implement, perhaps for the smoothing of sinew. The same may be said of the perforated bone object shown in Plate XXXVII, Fig. 5. On the other hand, the former object may have been used with a short bone tube or bead as a spreader for roached hair (p. 215).

Spinning and Weaving. While some of the perforated discs of stone (Plate XXXVII, Fig. 1; Plate XLI; Plate XLIV), of pottery (Plate XXXVII, Fig. 3), and of shell (Plate XXXVII, Fig. 4; Plate L, Figs. 9-13), may have served as spindle whorls it does not seem probable on account of the small perforation in some and the biconcave surfaces in many, that they were made for adjustment to a shaft and used in this manner. Some of them bear geometric designs, one a realistic pictograph. These are further mentioned on p. 210. No other objects supposed to have served in spinning or weaving were found and the only evidence of spinning is the impressions on pottery of twisted cord which may have been made without the use of a whorl (Plate XXIV, Fig. 6; Plate XXV, Fig. 3). The netting (Plate XXI, Fig. 15; Plate XXV, Figs. 1-2) shown by such impressions is the nearest approach to evidences of weaving.

Finger Nails and Tips. The finger nails and tips seem sometimes to have served in the place of tools in forming, or at least in decorating, pottery as indicated by the impressions on vessels (Plate LV, Figs. 1-10).

PROCESSES OF MANUFACTURE.

The processes employed in making the various objects found or indicated by finds on this farm comprise: rubbing, cutting, drilling, punching, chipping, flaking, pecking, modeling, impressing, twisting, knitting, and painting. These processes may each be illustrated by a series of specimens selected from the objects found.

Rubbing. Rubbing or polishing was the process by means of which practically all the objects formed by pecking and some of those formed by chipping were finished, also by means of which many objects were made. The rough grinding was no doubt done with coarse grindstones, like those

¹ Cf. Boas, Fig. 234, p. 433.

described on p. 197 and shown in Plate xxxvi, Fig. 1. The finer grinding or polishing was probably done with finer grinding stones and perhaps by rubbing with the hand or some fine materials, the nature of which is only conjectural. The results of this process are shown in objects made of stone (Plate xxxvi, Fig. 2), pottery (Plate xxxvi, Fig. 3), bone (Plate xxxvi, Fig. 5), antler (Plate xxxvi, Fig. 4), teeth (Plate xlix, Fig. 18), and shell (Plate xxxvi, Fig. 6).

Cutting. Cutting is illustrated by the flake of stone, possibly a flake-knife, shown in Plate xxxvi, Fig. 7, and the beaver tooth knives shown in Plate xxxiii, Figs. 11-14 both of which artifacts may have been used for cutting. The refuse from the process was probably too minute to be discovered; at least we found nothing which we recognized as such, but the products of this process are shown by cuts on objects of the following materials: stone (Plate xxxvi, Fig. 8), pottery (Plate xxxvi, Fig. 9), shell (Plate xxxvi, Figs. 10-11), bone (Plate xxxvi, Figs. 12-16), eagle claw (Plate xviii, Fig. 5), antler (Plate xxxvi, Figs. 19-21), and teeth (Plate xxxvi, Figs. 17-18). The history of the manufacture of arrow tips of antler and fish hooks of bone in which this process was used has been described on pp. 185 and 187 and is illustrated in Plate xxxviii, Figs. 8-21, and Plate xxxix, Figs. 1-10.

Drilling. Drilling is illustrated by drills chipped from stone which were described on p. 199, and shown in Plate xxxvii, Fig. 12. Drilling with a chipped stone drill usually resulted in a perforation tapering from the side from which it was drilled. In some cases the drilling was done from both sides, the two holes meeting and resulting in a bore which tapered from both ends, or where the process was continued long enough, the taper was lost and the hole came to have parallel sides. The refuse from this process was too minute for us to discover, but the results of the work are shown on objects made of stone (Plate xxxvii, Figs. 1, 2), pottery (Plate xxxvii, Fig. 3), shell (Plate xxxvii, Fig. 4), bone (Plate xxxvii, Fig. 5), teeth (Plate xxxvii, Figs. 6-9), turtle shell (Plate xxxvii, Fig. 10), and antler (Plate xxxvii, Fig. 11).

Drilling was also done with a tube which made a nearly straight sided bore and sometimes left a core as seen in the lower hole in the pipe shown in Plate xxxvii, Fig. 13. Sand and water may have accompanied the use of such a drill.

Punching. Punching was employed as a process as is shown by the holes in the bottom of some of the objects made of pottery, perforated from the inside before firing (Plate xxxvii, Fig. 14). This process caused the pottery to be depressed around the punched hole on the inner side and elevated in a little ring around the opening on the opposite side.

Chipping. A hammerstone (Plate xxxviii, Fig. 2; Plate xxxii, Figs. 1-6), such as is described on p. 196 is probably the tool that was used for chipping. Chips of stone, the refuse from this process are shown in Plate xxxviii, Fig. 3. Chipping is seen on the unfinished and rejected chipped objects shown in Plate xxxvii, Fig. 15; Plate xxxviii, Fig. 4 and on the chipped points (Plate xx), limestone discs and oblongs (Plate xxii, Figs. 2-4), and also on the edges of the unfinished pottery discs shown in Plate xxxvii, Fig. 16; Plate xli, Fig. 12. The method of manufacture of chipped points by the process of chipping has been described on p. 184 and is illustrated in Plate xxxviii, Figs. 1-3.

Flaking. Flaking to finish some chipped objects was probably done with the bone and antler cylinders mentioned on p. 198 and shown in Plate xxxviii, Fig. 5, and Plate li, Fig. 15. Flakes, the refuse from this process were found and are shown in Plate xxxviii, Fig. 6. The finished product, the result of flaking, is shown in Plate xxxviii, Fig. 7, and also by part of the work on the chipped points (Plate xx), and possibly by some of the work on the limestone discs and oblong (Plate xxii, Figs. 2, 4), while the history of manufacture by means of flaking is described on p. 185 and illustrated by the series of specimens shown in Plate xxxviii, Figs. 4-7. Short cylinders of antler, flat, battered, and splintered on one end, but convex on the other, perhaps flakers, and if so probably used with percussion on the end instead of with lateral pressure as the long cylinders were probably used, were found by Mills¹ in the Baum site.

Pecking. The process of pecking is illustrated by some of the specimens found, notably by the celts, stone discs, and pipes (Plate xxxvii, Fig. 17; Plate xxxi, Figs. 1-8; Plate xliii, Fig. 16; Plate xlvi, Fig. 7). These show the peck marks caused by striking the stone with a pebble or hammerstone. The refuse, fine dust, from this process is too minute to be found. After pecking the objects into shape they were often finished by grinding and polishing which effaced part of the peck marks or all of them if continued long enough. Finished objects made by this process are shown in some of the figures in Plates xxxi, xliii, xlvi. The method of manufacture of celts, discs, and pipes by this process has been mentioned on pp. 195, 210, and 213.

Modeling. Modeling was used in making the rims and handles of pots and in making pipes. The tools used in modeling have not been certainly identified. They may have been made of wood, but it is possible that some of the bone objects notably those mentioned on p. 201 and shown in Plate xxxiv, Figs. 3-15 were used for that purpose. Signs of the use of the fingers

¹ Mills, (c), p. 65.

and finger nails in modeling have been mentioned on p. 205. The finished products of modeling are shown in Plates xxvi-xxx; Plate xlviii, Fig. 1; Plate li, Figs. 1, 2, 4-6; and Plates liv-lix.

Impressing. Impressing upon pottery, before firing, with twisted cords and net work or cord and net covered paddles (Plate xxv, Fig. 1), carved paddles (Plate xxv, Fig. 6) and what may be a fruit pit (Plate lv, Fig. 11) seems to have been an intentional process of manufacture, at least in some cases. Some of the impressions may have been accidental or a by-product, as it were, of the manufacture of pottery dishes.

Twisting. The process of cord-making is known to have existed through the impressions on pottery previously described and shown in Plate xxv, Fig. 3. Cord was probably twisted with the fingers or upon the thigh and was no doubt made from vegetable material, possibly bass wood bark, as among modern Indians inhabiting the same linguistic area. No tools or waste from this process have been recognized as such among the finds made here.

Knitting. That net-making existed as a process, we know from the impressions of netting on pottery frequently mentioned before and shown in Plate xxv, Figs. 1, 2. Some of the bone objects, notably the awls and the spatulate bone shown in Plate li, Fig. 16 (p. 185) may have been used as shuttles or needles. No other tools or waste material from this process have been recognized as such if found at all.

Painting. The process of painting is known to have existed through the line work on the fragment of pottery described on p. 223 and shown in Plate liv, Fig. 11. The tools used in the process are unknown.

HISTORY OF MANUFACTURED OBJECTS.

The history of the manufacture of some classes of objects has been discussed with the description of each; points chipped out of stone on p. 184 (Plate xxxviii, Figs. 1-7); rubbed out of antler on p. 185 (Plate xxxviii, Figs. 8-18); fish hooks of two kinds on p. 187 (Plates xxxix, Figs. 1-9); pottery on p. 190 (Plates xxiv-xxx; Plate lv); celts made of antler on p. 196 (Plate xxxix, Figs. 11-14); scrapers made of bone on p. 201 (Plate xl, Figs. 1-3); and awls of several types on p. 202 (Plate xl, Figs. 1-2, 4-14). The history of the manufacture of other artifacts will be discussed: perforated phalanx bones on p. 210 (Plates xix, Figs. 6-9); perforated discs of stone on p. 210 (Plate xli, Figs. 1-10); perforated discs of pottery on p. 211 (Plate xli, Figs. 6-10; 11-15);

whistles made of bone on p. 212 (Plate XLII, Figs. 1-3); perforated penis bones of the raccoon on p. 204 (Plate XLII, Figs. 3-5); beads made of bone of various kinds and of various animals on p. 216 (Plate XLII, Figs. 10-14; 15-17); and pipes made of stone on p. 213 (Plates XLVI and XLVII).

GAMES, RELIGIOUS OBJECTS, PIPES, AND AMUSEMENTS.

A number of objects which were probably used in games and some of which were possibly so employed were found. They are shown in Plates XLIII and XLIV.

Tubes and Cylinders. The bone tubes mentioned on p. 186 (Plate XXI, Figs. 8-10), the cylinders made of bone mentioned on p. 198 (Plate LI, Fig. 15), and the cylinders made of antler mentioned on pp. 185, 198, 207, 221, and (Plate XLIII, Figs. 1-2) may have been used in gambling.

Dice. The astragalus bone of the deer (Plate XLIII, Fig. 8) may have been used as a die.

Ring and Pin Game. The phalanx or toe bones of the elk (Plate XLIII, Fig. 4) and deer (Plate XLIII, Figs. 5-7) perforated through the distal articulation and cut off around the proximal end were possibly used in a game resembling ring and pin. Digits of the deer with the proximal part cut off and the distal end perforated are found in abundance in the refuse pits but none have been found in the graves of the Gartner site.¹ None of these bones found here by us were shaped for use as arrow points like some of those described by Mills.²

Some of the bone awls described on p. 201 (Plate XLIII, Fig. 3) may have been used in connection with these toe bones for the pin. The phalanx bone or bones representing the ring may have been tossed up and caught on the point of an awl. These phalanx bones may be compared with others drilled and cut which are known to have been used in this game among the Algonkin, Athapascan and Siouan tribes³ where they are often drilled and notched. However, the same general game, but with some substitute for the phalanx bones is widely distributed in America as described by Culin. The number of the phalanx bones used is not constant. The game is played both for stakes and as a child's amusement. Possibly the perforated object cut out of the thin shoulder blade of a deer, mentioned on p. 205 and shown in Plate LIII, Fig. 3, may have served the purpose of the ring in this game. The humerus of a wild turkey with three perforations on each side near the

¹ Mills, (b), p. 58.

² Mills, (b), p. 41.

³ Culin, p. 527.

head, found by Mills in the Gartner site¹ may possibly have been used as the ring rather than for the attachment of rattles as mentioned on p. 212.

Manufacture of Phalanx Bone Objects. The history of manufacture of these phalanx bone objects is at least partly illustrated by specimens found here. The natural phalanx bone (Plate XLII, Fig. 6) was occasionally found, points chipped from stone, such as the one so made from chalcedony shown in Plate XLII, Fig. 7, which were probably used for cutting off the proximal end of the phalanx bones were common, drill points chipped from stone, such as the one chipped from chalcedony shown in the next figure, which were nearly as numerous were no doubt used for making the perforation in the distal end of the bone and the completed object made of the phalanx bone by cutting off the proximal end and perforating the distal end were fairly common.

Discs. It seems possible that some of the stone discs (Plate XLIII, Figs. 12-17; Plate XLIV) and possibly some of those that are perforated (Plate XLIV) may have been used in gambling. The discs and perforated discs made from potsherds (Plate XLIII, Figs. 9-11) and the perforated discs made of shell (Plate L, Figs. 9-11) may have been used in the same way, or possibly some of the stone and pottery discs were so used, while others were employed for spindle whorls (p. 205). It is possible that the chipped limestone discs (p. 189; Plate XXII, Fig. 2) were used in the same or a similar game. A discoidal stone² which in a way resembles these, but is larger, was found in the Gartner Mound.

Manufacture of Discs made of Stone. The manufacture of the discs made from stone may be illustrated from the specimens in the collection. The series consists of a piece of sandstone (Plate XLI, Fig. 1), a celt chipped and ground from jasper, such as may have been used to chip such stone into discs (Plate XLI, Fig. 6), a piece of sandstone chipped to a disc shape (Plate XLI, Fig. 2), fine-grained sandstone, such as may have been used to grind and smooth discs (Plate XLI, Fig. 7), a drill point chipped from chert such as may have been used for perforating discs (Plate XLI, Fig. 8), a piece of sandstone chipped to disc shape, roughly ground and partly drilled (Plate XLI, Fig. 3), a flake of jasper such as may have been used for countersinking and incising discs (Plate XLI, Fig. 10), a piece of sandstone chipped to disc shape roughly ground, drilled and countersunk (Plate XLI, Fig. 4), a small drill point chipped from chalcedony such as may have been used for dotting discs (Plate XLI, Fig. 9) and a finished perforated disc of sandstone marked with lines and dots (Plate XLI, Fig. 5). Some of the discs (Plate XLIII, Figs. 15-17) were pecked into shape and polished.

¹ Mills, (b), p. 57.

² Mills, (b), p. 13.

Manufacture of Discs made from Potsherds. The manufacture of discs made of potsherds may also be illustrated. The series consists of a potsherd (Plate xli, Fig. 11), a stone that may have been used for chipping potsherds (Plate xli, Fig. 6), a disc chipped from a potsherd (Plate xli, Fig. 12), a grindstone for smoothing the edge of such a disc (Plate xli, Fig. 7), a disc made of a potsherd with edge rubbed smooth (Plate xli, Fig. 13), a point for a drill chipped from chert for perforating the disc (Plate xli, Fig. 8), a disc made of potsherd with edge rubbed smooth and center perforation started (Plate xli, Fig. 14), and the finished product, a disc chipped from a potsherd with the edges rubbed smooth and the center perforated with a biconical hole made by drilling from both ends (Plate xli, Fig. 15).

Religious Objects. Some of the objects considered as personal ornaments on p. 214 may have been charms or amulets. The pipes considered on p. 212 were probably used in ceremonial and religious ways. Perhaps some of the bone tubes mentioned on p. 209 may have been used in such ceremonies. Similar tubes have been used by the Arapaho in the Sun Dance and by the Ojibway Indians living in Michigan.¹ The modeled pottery figures on and near the rims of the dishes (Plate liv, Figs. 3-10) suggests that some of the dishes may have had a religious significance or may have been used in religious ceremonies as may the painted design (Plate liv, Fig. 11) on the potsherd described on p. 223. The incised realistic scratches upon the objects shown in Plate lii, Figs. 8-13, the geometric designs shown in Plate lii, Figs. 2-6, and even some of the sculptures in stone, such as those shown in Plate lii, Fig. 14, and the modeled forms on pottery, such as the lizard and fish shown in Plate liv, Figs. 9-10, may have represented manitous or religious symbols.

Rattles. The fragment of perforated turtle carapace mentioned on p. 199 (Plate xxxvii, Fig. 10) may be part of a rattle used on the legs in religious dances; for, according to Mills,² a rattle made of the carapace of a turtle perforated for attachment and containing small pebbles was found on the leg of a skeleton in the Gartner Mound in Ohio. The skulls of wild turkeys usually perforated with one or more holes in the crown and containing from one to five pebbles which Mills believes to be knee rattles were often found in the Gartner Mound and below the knees on the skeletons in the Gartner site and at the Baum village along Paint Creek, Ohio, where wild duck skulls were also found.³ The humerus of a wild turkey with three perforations on each side near the head was found in the Gartner site.

¹ Smith, (f), p. 283.

² Mills, (b), p. 23.

³ Mills, (b), pp. 10, 23, 59.

This Mills considered to have been for the attachment of rattles but it may possibly have been used as the ring in the ring and pin game.¹ Perforated humerii of this bird were occasionally found throughout that site.

Gorget. Perforated gorgets made of stone were not frequently found, but a fragment of a gorget is shown in Plate L, Fig. 1. The surface of the stone is worn down around the perforation and in the lower edge may be seen part of an old perforation through which the object has been broken. The broken edge was afterwards somewhat smoothed. The object shown in Fig. 2 of the same plate may be a gorget although considered on p. 219 as an ornament. Another fragment of what may be a gorget, is shown in Plate xxxvii, Fig. 2. It was found in the general diggings of mound 1. There is a perforation through this fragment and the edge of the stone is grooved opposite it as if an old perforation had been broken out and the present one made since. There are notches in the side edges. After all, these may not have served as religious objects.

Whistles. The hollow light bird bones and the few small mammal bones cut off at the ends and drilled like pan pipes (Plate LI, Figs. 13-14) may have been used as whistles in religious ceremonials rather than for animal calls as mentioned on p. 186 or for amusement (p. 214).

Manufacture of Whistles. The history of the manufacture of this object is suggested by some of the specimens found here. Natural bird bones were occasionally seen. One of these (Plate XLII, Fig. 1) has the ends broken off; another, shown in the next figure, has seven vents and at one end another vent partly drilled. The third figure in this plate shows a drill point chipped from stone, such as may have been used in drilling these vents. The supposedly finished object is shown in Plate LI, Figs. 13, 14.

Pipes. Pipes made of stone, especially yellowish sandstone, were frequently found. Some were of limestone, but only one of pottery (Plate XLV, Fig. 11) was seen. The range of forms is shown in Plates XLV-XLVI, and includes the simple bowl shape (Plate XLV, Figs. 1-3), the elbow type (Plate XLV, Figs. 4-6), the platform type (Plate XLVI, Figs. 5-8), and specialized forms of these types. In the elbow pipes, the angle between the axis of the bowl and that of the stem is much greater than a right angle in most cases. There is also a rectangular pipe having nearly square sides, the bowl and stem of which are made in adjacent edges (Plate XLV, Fig. 10). Stone pipes, finished and unfinished, mostly of fine-grained sandstone, several of greenish argillite, and others of clay were found in the Gartner site. One is an elbow pipe made of compact sandstone, another a platform

¹ Mills, (b), p. 57.

pipe of greenish argillite.¹ A platform pipe made of reddish brown sandstone was found in the Gartner Mound.² No tubular pipes were found on the Fox Farm by us; but one of human form made of clay was found by Mills in the Adena Mound.³

Some of the pipes found here in Kentucky bear incised geometric designs, others realistic sketches, among which the human face appears. Still another is sculptured to represent a human foot (Plate XLV, Fig. 9). The pottery pipe bears a modeled geometric design. These attempts at decoration or symbolism are discussed under the subject of art on p. 223. One pipe (Plate XLV, Fig. 8) is of urn shape and of such artistic outline that it also is again mentioned there. As mentioned on p. 211, the pipes were probably used in ceremonial and religious ways.

Manufacture of Pipes made of Stone. The processes used in the manufacture of pipes and the life history of a pipe from the raw material to the finished object is somewhat illustrated by the specimens collected, especially those shown in Plates XLVI and XLVII. The cylinder of yellowish sandstone shown in Plate XLVI, Fig. 1, has a dot in one end, evidently intended for the beginning of the bowl. The specimens shown in Plate XLVI, Figs. 1-4 are evidently all unfinished simple bowl pipes of cylindrical or conoid form requiring simply to be drilled in the upper end for the bowl and provided with a small lateral perforation for the reception of the stem. The last of these is of limestone pecked into form, and has a drilling evidently the beginning of the bowl. The specimen shown in Fig. 5 in this plate was also pecked into form and the next one was pecked from limestone. The one shown in Fig. 7 of the same plate was apparently broken in process of manufacture. The broken pipe shown in Fig. 9 had drillings of conoid form for the bowl and stem, holes of which shape could have been made with a drill point chipped from stone (Cf. Plate XXXIII, Fig. 19), while the one illustrated in Fig. 12 has drillings of cylindrical form such as are made by drilling with a hollow drill resembling the modern diamond drill, possibly a hollow reed revolved between the palms or between a palm and a thigh was used, probably with some abrasive such as sand with water. Such a drill leaves a core like the one shown in the illustration. The specimens shown in Plate XLVII are all unfinished pipes of the elbow type, the third of reddish sandstone, the fourth of limestone, and the others of yellowish limestone, all of which were roughly pecked into form. The first is marked for the drilling which would form the bowl as is also the second which has been split longitudinally probably in the process of manufacture. The third has a drilling begun for both bowl and stem, while in the fourth

¹ Mills, (b), p. 59.

² Mills, (b), p. 17.

³ Mills, (a), pp. 14, 28.

the bowl has been begun, but by pecking instead of by drilling. The object shown in Plate LI, Fig. 3, is possibly but not probably an unfinished pipe. The unfinished pipes of the Gartner site show that they were made first by pecking and then by rubbing, and that the bowl was drilled first.¹ It is possible that some of the beads (Plate XLVIII) and pendants (Plate XLIX) may have been attached to the pipes.

Amusements. The astragalus bone of the deer mentioned on p. 209 (Plate XLIII, Fig. 8) as possibly a die may have been used as a buzz, and the thin perforated object mentioned on p. 209 (Plate LI, Fig. 3) may possibly have been part of a puzzle. The whistles mentioned on p. 212 may have been used for amusement.

WARFARE.

A number of objects were mentioned on p. 184 as having possibly or probably been used in both warfare and hunting. It is quite possible that some of the objects considered as articles of personal adornment may have been used as charms attached to weapons for warfare. A large object made of limestone, possibly a war club was found in the Gartner Mound in Ohio.²

DRESS AND ADORNMENT.

Some evidences relating to clothing materials, moccasins, hair spreaders, combs, and personal ornaments, such as beads, pendants, and discs were found. Personal ornaments were found in great numbers. They were made of stone, pottery, bone, teeth, and both fresh water and ocean shell. Under miscellaneous ornaments we consider evidences of ear and nose ornaments, necklaces, cut animal skulls, bracelets, rings, and pins. A few of the objects here considered may have been charms and were possibly used on weapons in warfare. Personal ornaments made of shell of the fresh water mussel and large and small ocean molluscs were found at the Gartner site.³

Clothing Materials. Skins of some of the animals mentioned on p. 181 et. seq. as represented by their bones, antlers, and teeth found in the refuse of this village site, such as the elk, deer, bear, wolf, red fox, lynx or wild cat, raccoon, opossum, beaver, mink, weasel, woodchuck, red or fox squir-

¹ Mills, (b), p. 59.

² Mills, (b), p. 14.

³ Mills, (b), p. 53.

rel, and pack or wood rat may have furnished the material for clothing. The eagle, owl, great blue heron, wild turkey, and duck may have supplied feathers for costumes and even the turtle may have contributed useful material (p. 211). The impressions of netting and cord upon the pottery shown in Plate xxv, Figs. 1-3, and casts taken of the impressions which show still more clearly that the cord was twisted, prove that fibers, probably vegetable, were spun (p. 205) and it is possible that they were woven into dress fabrics although it seems probable that the skins of animals furnished the material for most of the clothing. Impressions of cloth show on a pot¹ found in the Gartner Mound. Fragments of charred fabrics woven from vegetable fiber were found at the Gartner site where impressions of such fabrics appear upon almost every fragment of pottery.² Cloth of open twine weave was found in the Adena Mound.³ Little was found to indicate the costume worn here, there being no such find as that of the sculptured human form⁴ used as a tubular pipe, found in the Adena Mound, probably indicating the style of costume in that region. We found no mica here but that mineral used for a headdress was found by Mills in the Adena Mound.⁵ The somewhat lenticular piece of shell shown in Plate I, Fig. 6, with a perforation in each end, may have been used as an ornament fastened on to the costume (p. 220).

The phalanx bones of the deer and elk (Plate XLIII, Figs. 4-7) may have been used for a rattling fringe on the costume.

Moccasins. Moccasins were probably made from the skins of the deer and elk and possibly some of the other animals above mentioned. The sculpture shown in Plate LII, Fig. 15, apparently represents at least one of the types of moccasins worn here. The turning up and puckering of the toe is shown, while the gathering of the buckskin over the instep is at least suggested by the two concentric lines in that region. It will be remembered that certain tribes of Indians, for instance, the Ojibway of Michigan, have made moccasins in this particular way down to within a decade.

Hair Spreaders. The bone object described on p. 205 and shown in Plate LIII, Fig. 3, may have been used with a short bone tube as a spreader for roached hair. Mills considers that the larger double pointed awls made of bone and antler found on the Gartner site and in graves may have been used as hair pins, since in burials they were invariably found directly below the skulls.⁶

¹ Mills, (b), p. 22.

² Mills, (b), p. 53.

³ Mills, (a), p. 11.

⁴ Mills, (a), p. 28.

⁵ Mills, (a), p. 11.

⁶ Mills, (b), p. 48.

Combs. Although we found no object certainly used as a comb, the cut piece of antler shown in Plate xxxvi, Fig. 21, may be a fragment of one. Two comb-shaped objects¹ each with six teeth and made of rib bone, presumably of the elk, were found by Mills, in the Adena Mound side by side as if forming a twelve tooth comb.

Beads. A small number of the beads are made of pottery (Plate XLVIII, Fig. 1). They vary somewhat in size, but apparently were intended to be spherical in form. They were modeled in such a way as to form the perforations, rather than made by perforating the sphere of soft clay, or by drilling after it was fired.

Cylindrical objects made of sections of bird bones (Plate XLVIII, Figs. 2-11) were probably used for beads. Some are no longer than they are thick, others are at least four times as long as thick. Especially among the shorter bone beads we find the ends rounded, apparently by wear. A few like the specimen shown in Fig. 6 of this plate bear incised geometric decorations. One has irregular incised lines and gouged holes and across some of these holes the surface has been cut off, leaving a concave depression. Some of the beads may have formed bracelets, such as the one found by Mills,² in the Adena Mound where some were small disc-shaped beads³ made of bone. Beads made of the wing bones of birds especially of the wild turkey were found everywhere in the Gartner site and are associated with almost every necklace taken from the graves.⁴ Many bone tubes made from the wing bones of large birds were found in the site.⁵

The history of manufacture of one of these bone beads is suggested by some of the specimens found here, a few of which are shown in Plate XLII, Figs. 10-17. The first illustrates the natural tibia of a small mammal representative of many slender bones of mammals and birds found here; the last illustrates a chipped point made of jasper such as may have been used for cutting these bones and is representative of many such points chipped from stone found on this farm. The specimen shown in Fig. 11 of this plate is the same as the tibia at the first of the series but the distal end has been cut off. The next illustrates a piece of a long bone, and the next the end of the long bone of a quadruped from both of which the lower end has been cut like the preceding but these are also incised around a short distance above the end in process of removing the distal section for a bead. Fig. 15 shows the distal end of a humerus and Fig. 16 that of the metatar-

¹ Mills, (a), p. 24.

² Mills, (a), p. 15.

³ Mills, (a), p. 20.

⁴ Mills, (b), pp. 17-18, 56.

⁵ Mills, (b), p. 49.

sus of a deer from both of which a section probably for a bead has been cut. Fig. 14 shows such a section fully removed, that is, a bead finished except perhaps that the ends may have been rubbed smooth in some cases on a gritstone or worn smooth by actual use. The wing bone of the trumpeter swan from which the greater part had been cut away was found in the Gartner site.¹

Some of the shell beads were cylindrical (Plate XLVIII, Figs. 12-18). A few (Plate XLVIII, Fig. 14) were disc-shaped and some were made of large pieces of ocean shell. Sometimes, as in the case of those shown in Figs. 19-20 and 24 of this plate, whole shells were used and were not much changed from the natural form, being merely perforated for suspension. Shell beads were very abundant in the Gartner site, sometimes seven to eight hundred being found with a skeleton. Most of them were made from ocean shells.² Beads made of ocean shells³ were also found in the Gartner Mound. In the former at least they were from large shells. Shell beads were found in the Adena Mound.⁴ Small ocean shells, natural except pierced with a hole for attachment (Plate XLVIII, Fig. 24) were found here as in the Gartner site.⁵ A pearl bead (Plate L, Fig. 5) was found. Pearl beads were also found by Mills in the Adena Mound.⁶

Pendants. Pendants were made of stone, teeth, and shell (Plates XLVIII-L). The first seven figures in Plate XLIX show the range of forms of pendants made of stone. These are all of canal coal or carboniferous shale. The first is of claw shape, seems to be broken off at the base, has an incision across the upper surface near this broken end and on the reverse there is a perforation begun opposite this incision. The next is of lozenge shape, slightly convex on the reverse. This specimen has been perforated by drilling from each side. The third figure is perforated transversely by drilling from each side and is somewhat flattened on the reverse. While we could hardly say that this was shaped to imitate a canine tooth the pendants shown in Fig. 4 are probably intended to represent teeth or claws. They were found on the neck of skeleton 30 which suggests that they formed part of a necklace. The next two specimens somewhat resemble these while the seventh differs only in that there are small drilled pits on the sides and edges. The thin bone object shown in the eighth figure which has been mentioned on pp. 209 and 215 may possibly have been used as a pendant. Pendants were sometimes made of the teeth of at least three

¹ Mills, (b), p. 50.

² Mills, (b), p. 55.

³ Mills, (b), pp. 14, 17, 54.

⁴ Mills, (a), p. 16.

⁵ Mills, (b), p. 54.

⁶ Mills, (a), p. 28.

families of small carnivora (Plate XLIX, Fig. 9), the incisors of the elk (Plate XLIX, Fig. 10), and the canines of the wolf (Plate XLIX, Fig. 11), by perforating them through the root for suspension. Some of the wolf tooth pendants bear incised lines (Plate XLIX, Fig. 11; Plate LIII, Fig. 5). Pendants, each made by perforating the canine tooth of a mountain lion were found by Mills in the Adena Mound,¹ and as a necklace in the Gartner Mound.² Perforated canine teeth of the gray wolf used on a necklace and teeth of the dog, raccoon and wild cat used for pendants were also found in the latter.³

A pendant made by perforating the root of the canine tooth of an elk (Plate XXXVII, Fig. 9) was found in mound 2. While canine teeth of the elk, some perforated twice, were found in the Gartner site, they were rarely found in the graves of the Gartner Mound.⁴ Incisors of the elk, perforated or grooved were found in the Gartner site.⁵ The canine teeth of the black bear perforated through the base for suspension were frequently found here in Kentucky (Plate XLIX, Fig. 15). A few were grooved instead of being perforated, one of these is shown in the next figure. Fig. 17 shows a perforated specimen which has been flattened on one side. The next is flattened on the reverse while the obverse bears two parallel zigzag incised lines. On the left edge near the base is incised IIX. One old worn canine tooth of a bear which was found is apparently in process of manufacture into a pendant as a perforation is begun near its base. Pendants made of the canine teeth of the black bear perforated through the root were found in abundance in the Gartner site.⁶ Pendants made from the digits of the wild turkey occur in great numbers particularly with the burials in the same site.⁷ It is possible that the perforated phalanx bones mentioned on p. 209 (Plate XLIII, Figs. 5-7) may have been used for pendants. The claw of an eagle bearing incised lines, mentioned on p. 182 (Plate XVIII, Fig. 5) may have been used on a costume or necklace. Bear claws were found on the arm of a skeleton in the Adena Mound.⁸

Pendants of shell were numerous in the graves of the Fox Farm and there were several styles (Plate XLIX, Figs. 12-14; 19-25). The one shown in Fig. 13 may perhaps be considered as intended to represent a claw. Figs. 19 and 20 illustrate pendants that are crescent shaped. Crescents

¹ Mills, (a), p. 24.

² Mills, (b), pp. 10, 21.

³ Mills, (b), pp. 10, 18, 21.

⁴ Mills, (b), pp. 20, 56.

⁵ Mills, (b), p. 56.

⁶ Mills, (b), p. 57.

⁷ Mills, (b), p. 56.

⁸ Mills, (a), p. 26.

made of mussel shells were found at the neck of a skeleton in the Gartner Mound¹ and a crescent made of the outer whorl of an ocean shell was found in the same mound, while crescents made from shell were found in the village site.² Mills states that he has not been able to ascertain that they have been found in any great numbers at any other place in the vicinity, and in three seasons work at the Baum village he found none, although all other ornaments made of shell common to the Gartner site were found. The specimen shown in Fig. 21 is merely a natural shell with a perforation near the hinge. This perforation may have been accidentally made. The pendants shown in Figs. 23 and 24 were perhaps intended to be of tooth or claw shape. The one shown in Fig. 27 is also somewhat tooth-shaped. The next figure illustrates one of claw shape with incised lines and drilled dots while the next has a median longitudinal incised line and a transverse rather than a vertical perforation. Fig. 30 in this plate shows a long tooth-shaped pendant cut out of shell also with a transverse perforation. The next two pendants are somewhat similar but with vertical perforations. The specimens shown in Plate XLVIII, Figs. 19-21 may be considered as pendants instead of beads. They are but slightly changed from the natural form of the *Olivella* shell being only perforated while the next two specimens made from the same kind of shell have been cut out and perforated vertically through the upper end. Fig. 33 of Plate XLIX shows a pendant made of a *Busycon* shell slightly changed from its natural form. It is perforated for suspension. The next is grooved for suspension and most of the whorls of shell have been removed so that the pendant consists of but little more than the columella. The last figure in this plate shows a spoon-shaped pendant made of thin shell perforated at the narrow end. Pendants made from large ocean shells and of long strips or triangles, cut out of both fresh water and ocean shells but mostly from fresh water mussel shells were found in the Gartner site.³

The slate gorget (Plate L, Fig. 1) mentioned on p. 212 may have been a personal ornament rather than a religious object. The next specimen is a stone disc perforated at one edge and partly perforated from each side at the other. Some of the perforated stone discs mentioned on p. 210 (Plate XLIV, Fig. 4) may have been used for objects of personal adornment, and this seems even more likely of the perforated discs made from potsherds (Plate XLIII, Fig. 11). Probably those made of shell (Plate L, Figs. 5, 9-11, 13) were so used as they are small and decorative. The one shown in Fig. 5 has notches or scallops around the edge, bears an incised circle and

¹ Mills, (b), p. 14.

² Mills, (b), p. 54.

³ Mills, (b), pp. 54, 55.

radiating lines, and a pearl bead is stuck to it apparently by the decomposed material of the surface of the shell. It was found near the clavicle of skeleton 92 in mound 2 and had perhaps been fastened to some garment by a string or thread passing through the perforation and the bead and then back again through the hole in the disc. A small shell gorget set with a fresh water pearl was found in the Gartner Mound.¹ The specimen shown in Fig. 7 has only one perforation. It was found on the right arm of skeleton 60 in mound 2. The elliptical shell object shown in Fig. 6 has two perforations, one at each foci. These were apparently drilled from each side. It may have been fastened to a garment. The one shown in Fig. 8 has notches around the edge and two holes. These were apparently drilled only from one side and are broken out on the other. The thin circular concavo-convex shell objects shown in Figs. 3 and 4 of this plate each have two perforations. On the concave surface the former has five drilled pits; the latter incised lines. Small circular gorgets, some made of fresh water mussels and some of ocean shells but identical in form with two holes in the edge and one on the middle, two probably for suspension, the other for the reception of a pearl were found in the Gartner site.² The specimens shown in Figs. 12, 14, and 15 of the same plate are somewhat the same in style, each having two perforations, but are much larger. The first is made of the large end of a busycon shell and was found at the head of skeleton 98 in mound 2. This is the only shell disc with two perforations at the edge and one large one in the center found by us, but it will be remembered that such specimens were frequently found in the Gartner Mound.³ One of these is four inches in diameter, was made of conch shell and the central perforation is about half an inch in diameter. Many of them were made of mussel shells.⁴ The next specimen shown, Fig. 14, is concavo-convex and was found at the chest of skeleton 155 in mound 6. The last is somewhat of pear shape, also concavo-convex and was found at the neck of skeleton 144 in mound 6. These remind us of the shell discs engraved with such conventional figures as those of the rattlesnake, spider, and human form in the act of throwing the discs found in other parts of the United States, including Illinois, Kentucky,⁵ Tennessee, Georgia, Missouri, and also in Mexico. Gorgets made from large ocean shells were found in the Gartner site and Mills states that he found gorgets in the Adena Mound.⁶ Some of the objects here

¹ Mills, (b), p. 8.

² Mills, (b), p. 54.

³ Mills, (b), pp. 8, 23.

⁴ Mills, (b), p. 18.

⁵ Holmes, (a), p. 97; (c), Plates LXI-LXVI; LXXI-LXXV.

⁶ Mills, (b), p. 54; (a), pp. 14, 18.

considered as pendants, ornaments, or beads may have served as bait in fishing (p. 188).

Miscellaneous Ornaments. The fragments of pottery objects of spool shape, shown in Plate LI, Figs. 1-2, resemble the copper ear ornaments common in Southern Ohio. Ear ornaments were probably worn in the vicinity of the Adena Mound as they are indicated on the sculptured human form used as a tubular pipe found by Mills and as spool-shaped copper objects of similar shape are frequently found in other parts of the Scioto Valley.¹ The antler, bone, and shell cylinders shown in Plates XLIII, Figs. 1-3; LI, Fig. 15; L, Fig. 16, may have been ear or nose ornaments or made into chest shields of the form made up of long biconical shell tubes such as have recently been used by the Dakota Indians. Necklaces were probably made here of bone and shell beads with pendants of canine teeth and incisors of the elk as all these objects were found here and such necklaces were found in the Gartner site.² Part of the jaw of a bear, cut off through the roots of the teeth (Plate LI, Fig. 7) was found near the legs of skeleton 61 in mound 2 and another (Plate LI, Fig. 8) was found near the skull of the same skeleton. Cut bear teeth were found in the Gartner mound.³ The cut left ramus of the deer which Mills believes to be an ornament in process of manufacture but which may have been a corn scraper found in the Gartner site and cut jaws of the gray wolf, which he believed were also used as ornaments were found throughout that site but not in the graves. The cut ramus of a wild cat was also found there. The cut skull of a dog with the top and jaws notched possibly to fasten them together was found in the Gartner site but none were found in the graves. A cut skull of a mink with the top of the skull and jaws notched possibly to fasten them together was found in the Gartner village site. Such cut skulls were not found in the graves.⁴

No copper bracelets were recognized here although some of the beads may have been strung as bracelets and it will be remembered that Mills secured copper bracelets⁵ in the Adena Mound and with an adult male skeleton in the same mound a bracelet made of bone beads was found.⁶ No finger rings were found here but copper rings were found by Mills in the Adena Mound.⁷ Double pointed objects considered by Mills as pins were found in the Gartner site.⁸

¹ Mills, (a), p. 28.

² Mills, (b), p. 56.

³ Mills, (b), p. 17.

⁴ Mills, (b), p. 58; (c), p. 78.

⁵ Mills, (a), pp. 10, 13.

⁶ Mills, (a), p. 15.

⁷ Mills, (a), p. 11.

⁸ Mills, (b), p. 48.

ART.

The graphic and plastic art of the prehistoric people of the Fox Farm is illustrated by many objects (Plates LII–LIV), some of stone, bone, shell and pottery, and consists of engraving, notching, modeling, impressing, sculpturing, and painting.

There are many engravings on stone (Plate LII, Figs. 1–13). One specimen of yellowish gray sandstone bears parallel incisions on one side and two sets of such incisions form diamond-shaped hachure on the other. Incised lines occur on a platform pipe of greenish argillite found in the Gartner site¹ and on a stone pipe found in the Mound.² A few of the bone objects (Plate LIII, Fig. 2), several teeth (Plate XLIX, Fig. 18; Plate LIII, Figs. 5–7), and shell pendants (Plate LIII, Figs. 9–10) were engraved. Incised lines cut crosswise ornamented the concave surface of the canine teeth of the gray wolf and mountain lion in the Gartner Mound.³ Engraving upon pottery (Plates LVII–LIX) was apparently done before firing. The handles of the larger vessels at the Gartner village site were invariably ornamented with incised lines.⁴ Notching on some of the stone objects (Plate LII, Fig. 7; Plate XXXVII, Fig. 2), bone awls (Plate XXXIV, Figs. 4, 7; Plate LIII, Fig. 1), and shell objects (Plate L, Figs. 5, 8; Plate LIII, Fig. 8) may have been done for aesthetic reasons. Notches ornament some of the awls made from the tarsometatarsus of the wild turkey found in the Gartner site.⁵ In this class may be mentioned the pits drilled in the perforated stone discs (Plate LII, Figs. 5–6), pits in the claw-shaped stone pendant (Plate XLIX, Fig. 7), in a spatulate bone object (Plate LIII, Fig. 4), in a shell pendant which is also of claw shape (Plate LIII, Fig. 10), and the drilled holes through the pendant made of bone (Plate LIII, Fig. 3). Impressions of finger tips and nails (Plate LV, Figs. 1–9) and of paddles carved or wrapped with cord or netting (Plate XXV, Figs. 2, 3, 6), impressions of what appears to be a pit (Plate LV, Fig. 11), and modeled lines (Plate LVI, Figs. 8–10) were all made on pottery before firing, as were the modeled points regularly arranged (Plate LVI, Figs. 3, 4, 7; Plate LIV, Fig. 1), pressed notches (Plate LVI, Figs. 1–2), and ridges incised (Plate LVI, Figs. 5–6) and a knob with central depression (Plate LIV, Fig. 1). The impressions of carved and cord and netting wrapped paddles upon pottery were probably incidental to manufacture or to roughen the surface for practical reasons rather than

¹ Mills, (b), p. 59.

² Mills, (b), p. 18.

³ Mills, (b), p. 21.

⁴ Mills, (b), p. 36.

⁵ Mills, (b), p. 47.

intended to beautify the pottery although the latter purpose may have been partly or wholly in the mind of the maker. Dots were pecked into the soft clay of the field bearing the sculpture of an animal (Plate LIV, Fig. 9) and into the animal's back, as well as to indicate its eyes, before the clay was fired for pottery. Decorations consisting of indentations of a blunt tool and others made with a reed or hollow instrument were seen on the ordinary potsherds and invariably on the handles of the larger vessels found at the Gartner village site.¹

A piece of yellowish sandstone bearing grooves on the reverse was sculptured to represent the human face (Plate LII, Fig. 14) and another piece (Plate LII, Fig. 15) represents a moccasin (p. 213). We found no sculptured pieces of bone and shell, but a sculptured fox head forming the basal end of a large awl was found in the Gartner Mound² and a sculptured figure of a raccoon made of shell was found in the Adena Mound.³ Modeled animal forms and handles on pottery (Plate LIV, Figs. 3-10, Plates xxvi-xxx) especially the latter were common. Figs. 3 to 7 in Plate LIV apparently represent duck heads and were all broken from the edges of dishes. The next specimen is a crude representation of the human face on a pot lug and another such lug was found in the general diggings of mound 1. A sculptured human form made of clay and used as a tubular pipe was found by Mills in the Adena Mound.⁴ Fig. 9 of the same plate apparently represents a lizard. The effigy of a lizard, according to Mills, decorated a potsherd found in the Gartner village site.⁵ The next fragment apparently represents the head and back of a fish.

A single example of line painting was found on a fragment of pottery (Plate LIV, Fig. 11). It is dark red in color and of crude technique. Some of the human bones in the Adena Mound of Ohio were painted red according to Mills.⁶ The shear form of one of the pipes (Plate LIV, Fig. 12) and of some of the pottery vessels as indicated by fragments, is of a rather artistic nature.

There are realistic representations, conventionalized figures, pictographic markings, and geometric patterns, some of the last of which may be merely decorative and not at all representative. Of realistic art, the engraved animal forms (Plate LII, Figs. 8, 9; Fig 1c), incised human faces (Plate LII, Figs. 10-12), sculptured face (Plate LII, Fig. 14), incised human form (Plate LII, Fig. 13), and sculptured foot (Plate LII, Fig. 15) are all in

¹ Mills, (b), p. 36.

² Mills, (a), p. 27.

³ Mills, (b), p. 16.

⁴ Mills, (a), p. 28.

⁵ Mills, (b), p. 36.

⁶ Mills, (a), p. 22.

stone and the duck or bird heads (Plate LIV, Figs. 3-7), the human faces on pot lugs (Plate LIV, Fig. 8), lizard (Plate LIV, Fig. 9), and fish (Plate LIV, Fig. 10) are in pottery. Some of these may also be considered as conventional. Of pictographic markings there are the incised animal forms and scratches on stone (Plate LII, Fig. 8). Among geometric forms there are the incised lines and lines arranged with dots on the stone discs (Plate LII,

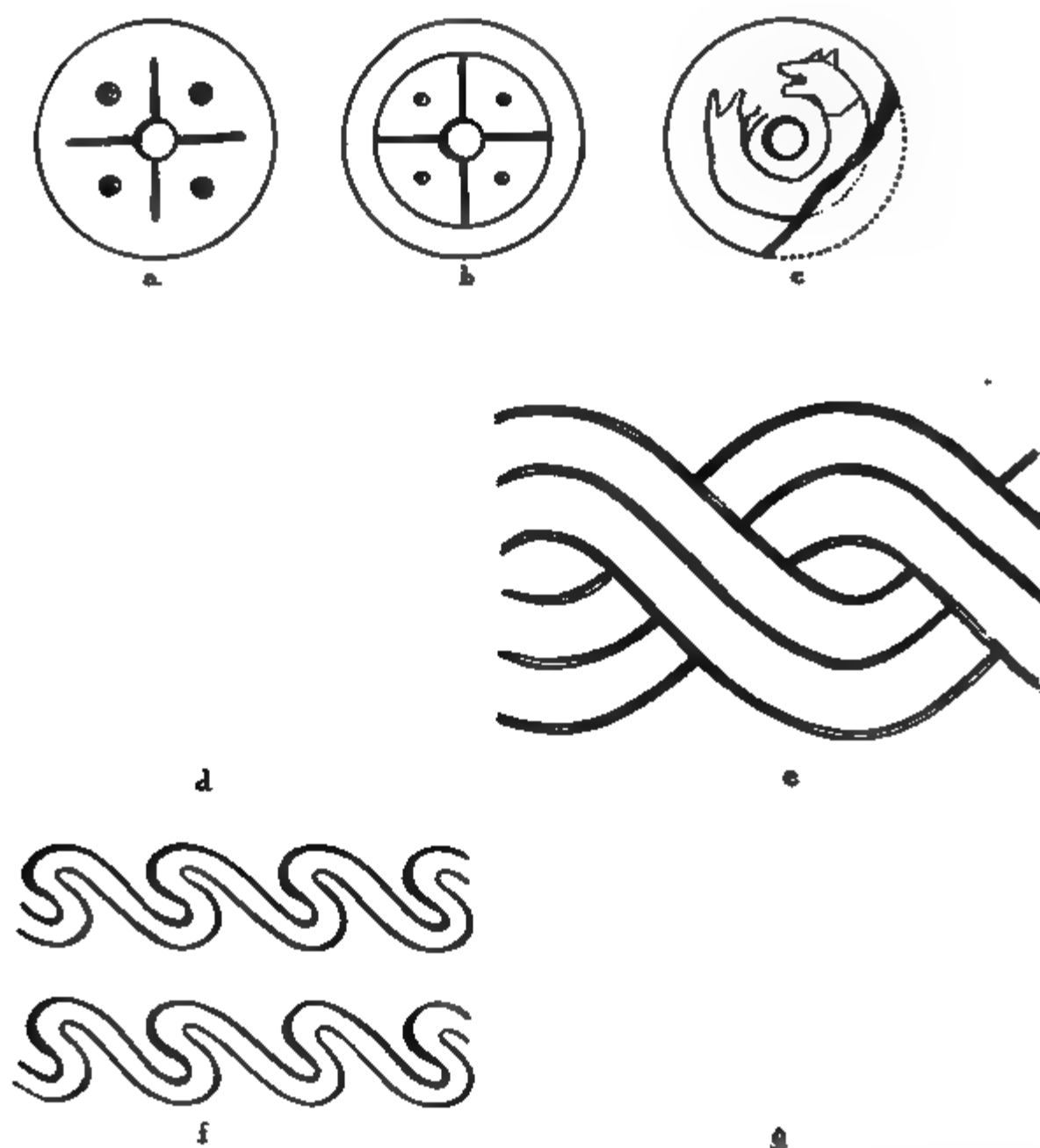


Fig. 1. Designs on Certain Stone and Pottery Objects. † nat. also.

Figs. 4-6), and the incised designs (Plates LVII-LIX), the regularly arranged nipples (Plate LVI, Figs. 3-4, 7; Plate LIV, Fig. 1), pressed notches (Plate LVI, Figs. 1-2), and notches incised in ridges (Plate LVI, Figs. 5-7) all on the pottery as well as impressed depressions (Plate LV) and scrolls (Plate LVI, Figs. 8-10) on the same material. Incised lines in the form of a scroll decorated and encircled the upper portion of the bowl of a pot found in

the Gartner Mound.¹ Below the scroll are two incised lines running around the vessel. The incised XIII X and IIXII on pendants made of the canine teeth of the wolf and IIIXIII on the canine tooth of a bear (Plate LIII, Figs. 5-7) found on the Fox Farm may also be considered as geometric.

Whether the geometric designs on some of the stone discs (Plate LII, Figs. 4-6) and realistic pictographs (Plate LII, Fig. 9) were used for decorative or for symbolic purposes or both is conjectural. The animal figures scratched on stone (Plate LII, Figs. 8, 9) and modeled in pottery (Plate LIV, Figs. 3-10) may represent the manitous of the maker or owner (p. 221).

The technique of some of the incised geometric designs on stone (Plate LII, Figs. 5-6), bone (Plate LIII, Fig. 4), and shell (Plate LIII, Figs. 9-10) especially on the stone objects, is good. Some of the geometric designs on stone (Figs. 1a, 1b) and modeled in pottery are of excellent patterns (Fig. 1d-g) but the execution is crude; that of the realistic pictographic sketches incised on stone (Plate LII, Figs. 8-9 and Fig. 1c) is inferior to the geometric designs (Plate LII, Figs. 4-6). The modeled animal heads (Plate LIV, Figs. 3-8) are crude. It will be remembered that shell discs much more artistically and elaborately carved than anything seen by us from the Fox Farm have been found in this general region (p. 220).

In art and technique the material found here is practically identical with that collected from the Madisonville Prehistoric Cemetery of Ohio, by Prof. Frederick W. Putnam, Dr. Charles L. Metz, Prof. M. H. Savillé, myself, and others who have explored there in later years, as it is with that from the village sites of Fort Ancient, Oregonia, the Adena Mound, the Gartner village site and Mound, the Baum Prehistoric village site and the Robert Harness Mound all also of Ohio. In the Robert Harness Mound, however, Mills also found intrusive material of the Hopewell culture and the Edwin Harness group was of the Hopewell Culture.²

INJURIES AND DISEASES.

Many of the skeletons show that the people suffered from injuries such as wounds and fractures as well as exceedingly from one or more painful bone diseases.

Scalp Cuts. A skull found in grave 195 bears a line of short and more or less parallel cuts across the frontal and right parietal. These may have been caused by scalping after, or immediately before death, at least the

¹ Mills, (b), p. 22.

² Mills, (d), p. 83.

individual did not live long enough for perceptible inflammation or repair of the bone to take place.

Arrow Wounds. Examples of arrow wounds were found. Two lumbar vertebrae from skeleton 179 each show a wound caused by a slender arrow point chipped out of chert the broken tip of which was found between them. The heel bone of skeleton 132 has imbedded in it a fragment of a slender arrow point chipped out of chert. The arrow point had been shot in from the rear and broken off so that the projecting part was not discovered until the bone was washed.

Fractures. A unique example of the fracture and repair of the middle of the shaft of the left ulna and a new joint formation between the head of the radius and the distal end of the humerus was found in skeleton 185, probably of an adult, and has been described by Hrdlička.¹ The hooked proximal end of the ulna probably held that bone in place at the elbow and caused it to break when it received the injury that brought about this condition, while the head of the radius being more easily dislocated was torn out of position and consequently the shaft was not broken. As repair took place, the proximity of the fractured terminal segment of the ulna to the adjacent portion of the radius which was probably injured by it, caused the union of the broken parts of the ulna and a bridge connecting this junction with the adjacent part of the radius. This would prevent the turning of the left forearm.

A new free joint-formation took place between the head of the dislocated radius and a bony process probably an ossified attachment projecting from above the articular surface of the distal end of the apparently normal and uninjured humerus. The process ends in an articular socket. Its distal two thirds are free from the humerus. Hrdlička states that the process no doubt was covered with synovium. The head of the radius underwent no change unless it may have been a very slight lengthening. This supports the probability that the bones at the time of fracture and dislocation were those of a fully developed adult. The cause of the new process was probably a moderate injury either to the ligaments or the periosteum of the distal end of the humerus. This could only have taken place while the elbow was held comparatively motionless and resulted in the practical immobility of the elbow joint. Hrdlička states that such formations are extremely rare in man and that he has been unable to find a similar case described. Regeneration of bone, to which the process is related, is much more frequent in lower animals than in man. Another example of repaired fracture may be seen in the right clavicle of skeleton 132 found in mound 3.

¹ Hrdlička, p. 550.

Diseased Individuals. Ninety-nine well-preserved and nearly complete skeletons out of those found in the two hundred and eight graves explored were selected for examination without regard for their normal or pathological character. The missing bones of incomplete skeletons might or might not be pathological and consequently incomplete skeletons were not used in obtaining the following results:

19 or 19 + % of the 99 were pathological.
 0 " 0 % " " 24 children were pathological.
 3 " 15 % " " 20 youths were pathological.
 9 " 27 + % " " 33 men were pathological.
 7 " 31 + % " " 22 women were pathological.
 16 " 29 % " " 55 adults were pathological.

Bones Diseased. The portion of the body most affected is indicated by the following table:

Out of 20 pathological individuals the skull in 4 or 20% of the cases was pathological.
 An arm bone in 9 or 45% of the cases was pathological.
 The humerus in 5 or 25% of the cases was pathological.
 The lower arm in 4 or 20% of the cases was pathological.
 A leg bone or bones in 12 or 60% of the cases was pathological.
 The femur in 4 or 20% of the cases was pathological.
 The lower leg in 11 or 55% of the cases was pathological.
 A vertebrae in 6 or 30% of the cases was pathological.

From this it is seen that the pathological condition is widely distributed but that the lower leg presents the most frequent and extensive cases.

The distribution of the pathological bones in the bodies of the individuals is indicated by the following statement:

Out of twenty individuals, all pathological.

9 or 45% were affected in one region of the body only.
 6 or 30% " " " two regions of the body only.
 2 or 10% " " " three regions of the body only.
 2 or 10% " " " four regions of the body only.
 1 or 5% " " " five regions of the body only. Not counting four of the twenty that were diseased in the vertebrae only, out of sixteen.

5 or 30% were affected in one region of the body only.
 6 or 36% " " " two regions of the body only.
 2 or 12% " " " three regions of the body only.
 2 or 12% " " " four regions of the body only.
 1 or 6% " " " five regions of the body only.

From this it is seen that the number of individuals having the pathological condition varies inversely with the number of regions affected, and suggests that as the condition became intensified it spread to various parts of the body.

Identification of Disease. The identification of the disease, or diseases, which caused these lesions of the bone have not been made, although the bones have been examined by a number of medical men. Dr. T. Mitchell Prudden among others who examined them informed me that attempts at identification from such bones are very unsatisfactory. It has been suggested that these lesions may be tubercular, rheumatic, or syphilitic but, in an endeavor to ascertain if they might not be due to some other cause, suggested by Dr. Prudden, I made an approximate identification of the sex of each pathological skeleton, and allowing for error, found that apparently nearly equal numbers of males and females were affected with an approximately equal distribution over the body. As it seems likely that the males would receive more wounds, especially in battle, than the females, this seems to suggest that the condition was not caused by neglected wounds but rather by some disease such as one or more of those previously mentioned. Thus no relation between sex and pathological condition was found, similar bones in each being affected with about equal severity and frequency.

Longevity. The ages of the individuals at the time of death varied from infancy to old age. There were found many skeletons of infants. Among the well-preserved skeletons, which of course may not indicate the exact normal number of deaths because skeletons of certain ages may resist decomposition longer than others, be buried under conditions bringing about the same result or precluding our finding a normal proportion of them, it may be seen that the distribution of deaths in ninety-nine carefully selected cases was twenty-four children, twenty youths, and fifty-five adults (thirty-three men and twenty-two women).

METHOD OF BURIAL.

Mounds. The dead were deposited in the ground in graves many of which were grouped, each group being covered by a low dome-shaped mound, one of which is shown in Plate XL, Fig. 1. The graves were often close to each other. Plate LXI shows their relative distribution in the mounds, while in Fig. 2 of this plate it may be seen that they were at various depths. Other graves were found near these mounds and it is quite pos-

sible that they were in mounds, long since reduced by many years of cultivation. Skeletons were found at various depths in the Adena Mound and rude sepulchers made of unhewn logs were indicated by molds in the soil.¹ Calcined human bones found in that mound were interpreted by Mills as proof that the body had been cremated.² He also states that the soil from which the Gartner Mound of Ohio was made had evidently been collected from the village site and that in every portion of the mound various implements and ornaments were found intermingled with the soil.³ One burial there was considered intrusive but the burials in two sections were in every portion and even below the base while in one section the bodies had been cremated and the ashes, personal belongings, and unburned animal bones had been deposited upon a level clay floor.⁴ The majority of the dead at the Gartner site were cremated and placed in the mound. No cremated remains or evidences of cremation were found outside the mound.⁵

"Altars." Near the center of mound 1 was a so-called "altar" consisting of a saucer-shaped hollow about eighteen inches in diameter in the clay floor of the mound (Plate LX, Fig. 2). The floor was burned to the consistency of soft brick for some distance around the basin which was filled with ashes. A similar "altar" was found in the camp trench.

Graves. Some of the skeletons both in and out of the mounds were simply in the ground covered with refuse and soil (Plate LXI, Fig. 1), others had limestone slabs laid crosswise over them at a distance averaging perhaps one foot above the skeleton and one foot below the surface of the soil (Plate LXII, Fig. 1), except in the mounds, where the depth was often greater (Plate LXI, Fig. 2). Still other skeletons in addition to having these flat covering slabs had slabs along the sides and ends (Plate LXIII, Fig. 1) and one skeleton (Plate LXIII, Fig. 2) also had a pavement of these stones below it. In some cases where there were side and end stones, there were no covering slabs, but this was probably due to the fact that plowing had disturbed them. A grave with stone slabs at the head and foot supporting a longitudinal cover of logs indicated by molds in the soil was found by Mills in the Adena Mound. A layer of bark was found covering the bottom of a grave in the same mound and bark was found covering some of the burials.⁶ Burials of the Gartner village were similar in every respect to those of the Baum site. Each family apparently had its own burial place near its home.⁷

¹ Mills, (a), pp. 7, 20.

² Mills, (a), p. 25.

³ Mills, (b), p. 6.

⁴ Mills, (b), pp. 6, 16.

⁵ Mills, (b), p. 62.

⁶ Mills, (a), pp. 16, 21.

⁷ Mills, (b), p. 60.

Position of the Skeleton. There seems to have been no particular position for burial, for the skeletons were found lying in different directions (Plate LXI, Fig. 2). They were all placed upon the back, however, sometimes with the arms along the sides (Plate LXII, Fig. 2; Plate LXIII, Fig. 2). Often the legs were flexed, usually to the right or left (Plate LXI, Fig. 2), but in one case they were found with the knees elevated. This suggests that possibly all of the flexed burials were made in this position and during the decay of the body the knees fell to one side or the other. In one case, as shown in the middle skeleton in Plate LXI, Fig. 1, the forearms were flexed so that the hands were at the shoulders. At the Baum and Gartner sites the majority of the skeletons were found at full length,¹ but some of those found in the Gartner mound had the knees flexed to the right; while in the Gartner village site one skeleton was flexed to conform to the size of the refuse pit in which it was found.² A headless skeleton was found in the Gartner Mound.³

Plural and Bundle Burials. In a number of cases, more than one skeleton was found in the same grave. Usually, one was in anatomical order (Plate LXIV, Fig. 2) and the other skeleton or skeletons were bundled over it (Plate LXIV, Fig. 1). A double burial in which the skeletons were in order and at length, that of an aged couple, was found at the Gartner site⁴ and double burials were found in the Adena Mound, the two skeletons being parallel but the head of one at the feet of the other.⁵ I found a stone grave burial of this kind on a hill top of the Hayner Farm north of the Little Miami River between Morrow and South Lebanon while carrying on explorations for the World's Columbian Exposition in 1892. A skeleton found crosswise over the feet of another in a sepulcher in the Adena Mound of Ohio suggested to Mills the possibility that it was a human sacrifice.⁶ A skeleton found by Mills in the Adena Mound suggested that the body had been first placed in another place and later transferred to the Mound as the bones were not in anatomical order⁷ but there was no evidence that the bodies were first placed on scaffolds and afterwards interred at the Baum and Gartner sites.⁸ The finding of burials in the refuse pits of the Baum site⁹ suggests that they were intended as temporary interments. If such burials were reinterred with a later one, the bones might be found disar-

¹ Mills, (b), p. 61.

² Mills, (b), pp. 25, 61.

³ Mills, (b), p. 17.

⁴ Mills, (b), p. 61.

⁵ Mills, (a), p. 14.

⁶ Mills, (a), p. 25.

⁷ Mills, (a), p. 16.

⁸ Mills, (b), p. 61.

⁹ Mills, (c), p. 84.

ranged as in a burial at the Adena Mound¹ and in some of the double burials found here in Kentucky.

Artifacts in Graves. Objects were nearly always found with the skeletons. Ornaments and beads only were with some of the skeletons of children. Artifacts were so very numerous in the village site and mounds that some of them were found in the soil of the graves. This may account for the presence of objects with some of the skeletons. A pottery bowl with a unio shell, concave side down, in the bottom was found in grave 205 on the left chest of the skeleton of a child. Artifacts were found with some and not with other burials in the Adena Mound.² Mills considers some of the animal bones found in this mound to be the remains of a sacrifice made near a grave and afterwards deposited over it.³ Implements and ornaments were placed with the bodies buried at full length in the Baum and Gartner sites⁴ and objects were found with some skeletons and not with others in the Gartner mound.⁵

CONCLUSION.

The material culture of this prehistoric site in Kentucky may here be briefly characterized. A variety of the animals and plants of the region were used for food. Some of these animals though historically known in the state are now extinct in the vicinity. Bones, antler, teeth, shell, and vegetable substances were used as material for weapons, tools, and other manufactures. Among objects used in securing food by means of hunting and fishing, projectile points were made by chipping stone and by shaping antler tips. Fish hooks of bone and nets were made. Local shells were used in a way that smoothed and sharpened the edge. Chipped discs of limestone were common. Among tools supposed to have been used by men were many celts pecked and polished from stone but a few were chipped from stone and several were cut out of antler. There were hammerstones made of pebbles and whetstones of sandstone. The pitted stone also occurred here. Beaver teeth supposed to have been used for knife points were found, knives and drills were chipped out of stone, and the hollow cylindrical drill is known to have been used. Among tools thought to have been employed by women are scrapers chipped from stone and cut out of

¹ Mills, (a), p. 16.

² Mills, (a), p. 8.

³ Mills, (a), p. 25.

⁴ Mills, (b), p. 61.

⁵ Mills, (b), p. 21.

bone, and awls, many of them made of ulnae of various animals and of turkey bones. A few needles were also found. The people worked by rubbing or grinding, polishing, cutting, drilling, punching, chipping, flaking, pecking, modeling, impressing, twisting, knitting, and painting. Many discs made of stone and potsherds, most of them being perforated in the center, that may have been used in games were found. Fragments of pottery showed that the people of the site were proficient in its manufacture. Besides cooking pots, pipes, and beads were made of pottery. The pottery found here belongs to the Ohio Valley group and differs from some of that of Western Kentucky which belongs to the middle Mississippi Valley group.¹ It was decorated in various ways, especially with incised designs, impressions, and sculptured animal heads, while many pieces had handles or lugs. The lugs varied greatly in size and shape. No mortars or pestles were found here. Pipes made of stone were abundant and one of pottery was found. The people were fond of personal adornment and used beads of pottery, bone, and shell, also pendants of stone, teeth, and shell, and ornaments, many of them more or less circular in form and perforated for suspension, some were of stone, many of shell. The people decorated many of the things they made, especially by incising, notching, and modeling. They made both geometric designs and realistic representations. Some of the latter were incised, others were modeled. These represented lower animals and the human form. The people suffered from wounds and injuries besides greatly from a terrible disease which affected the bones of both sexes in many cases in all regions of the body. They buried the dead, both at length and flexed, in graves, some of which were grouped and covered with large mounds. Some bodies were more or less surrounded by limestone slabs forming what are called "stone graves." Artifacts were buried with the dead and double burials were made. The people were somewhat agricultural as is shown by the presence of corn and beans, and in this respect resemble those of the Gartner and Baum sites.² Intertribal trade or gifts, conquest or extended journeys, are indicated by ocean shells, here as they are by mica and ocean shell in the Gartner site.³ Nothing of copper or obsidian was found.

The inhabitants of the village site were apparently the builders of the mounds as indicated by the similarity of the artifacts found in each. It will be remembered that the inhabitants of the Gartner village were the builders of the mound there.⁴ Shell crescents were found here in Kentucky and it

¹ Holmes, (b), p. 182, Plate IV. Middle Mississippi Valley pottery is found even further east than here.

² Mills, (b), p. 65.

³ Mills, (b), p. 65.

⁴ Mills, (b), p. 63.

will be remembered that Mills states that the Baum site differs from the Gartner site only in the absence of shell crescents.¹

The material culture of this site in Kentucky resembles that of the Adena Mound, Baum² and Gartner sites, the main or early part of the Robert Harness Mound, and the Oregonia, Fort Ancient, and Madisonville sites of Ohio. It belongs to what Mills has termed the "Fort Ancient Culture"³ as different from the Hopewell culture (the Upper Mississippi pottery area) or the Northwest group described by Holmes⁴ common to the Turner, Hopewell (North Fork or Clark) and the Edwin Harness groups and Siep Mound.⁵ There are many remains both on the surface and in the soil of the village site, mounds, and graves while in the sites of Hopewell culture remains are comparatively scarce until a deposit is found. The pottery is of the poor type which Holmes has stated belongs to the archaic northern division of the art, rather than to the more highly developed southern pottery.⁶ Although the pottery found here and on other sites of Fort Ancient culture is of the Ohio Valley type, yet the distribution of Ohio Valley pottery and that of other classes of cultural remains of the Ohio Valley pottery province is yet to be correlated.⁷ The Fort Ancient culture, which, as Moorehead⁸ states, is not yet definitely placed, is now known to be found at least here in Kentucky, as well as in Ohio.

¹ Mills, (b), p. 65.

² Cf. Mills, (c), p. 95.

³ Mills, (d), p. 83; Holmes, (b), p. 182.

⁴ Holmes, (b), p. 193.

⁵ Mills, (e), p. 56.

⁶ Holmes, (b), pp. 183, 186.

⁷ Cf. Holmes, (b), p. 187.

⁸ Moorehead, p. 143.

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PLATE XVII. RESOURCES — ANIMAL MATERIALS.

From general diggings of mound 1.

- Fig. 1 (20-280). Left half of the lower jaw of a black bear.**
- Fig. 2 (20-292). Right half of the lower jaw of a Virginia deer.**
- Fig. 3 (20-290). Right half of the lower jaw of an elk.**
- Fig. 4 (20-305). Skull of a raccoon.**
- Fig. 5 (20-304). Skull of a red fox.**

АВТОР. Р. А. М. Н. Н.

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PLATE XVIII. RESOURCES — ANIMAL MATERIALS.

Fig. 1 (20-1176). Lower mandible of a great blue heron. From general diggings camp trench.

Fig. 2 (20-350). Right tarsometatarsus of a wild turkey. From general diggings of mound 1.

Fig. 3 (20-749). Ilium of a duck. From general diggings of mound 2.

Fig. 4 (20-372). Clavicle of an owl. From general diggings of mound 1.

Fig. 5 (20-396). Phalanx of an eagle bearing incised lines. From general diggings of mound 1.

Fig. 6 (20-746). Left half of the lower jaw of a lynx or wild cat. From general diggings of mound 2.

Fig. 7 (20-306). Right half of the lower jaw of an opossum. From general diggings of mound 1.

Fig. 8 (20-307). Right half of the lower jaw of a woodchuck. From general diggings of mound 1.

Fig. 9 (20-696). Left half of the lower jaw of a beaver. From general diggings of mound 2.

Fig. 10 (20-1293a). Left half of the lower jaw of a red or fox squirrel. From a lot of 178 such half jaws at pelvis of skeleton 190, in field.

Fig. 11 (20-796). Skull of a pack or wood rat. From left shoulder of skeleton 63, mound 2.

Fig. 12 (20-1298). Right half of the lower jaw of a mink. From the left pelvis of skeleton 193, in field.

Fig. 13 (20-745). Skull of a weasel. From general diggings of mound 2.



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PLATE XIX. RESOURCES — ANIMAL AND PLANT MATERIALS.

Fig. 1 (20-302a). Rear portion of the plastron of a box turtle. From general diggings of mound 1.

Fig. 2 (20-303). Portion of the carapace of a turtle. From general diggings of mound 1.

Fig. 3 (20-409). Vertebra of a fish. From general diggings of mound 1.

Fig. 4 (20-420a). Large unio shell. From general diggings of mound 1.

Fig. 5 (20-420b). Small unio shell. From general diggings of mound 1.

Fig. 6 (20-1303a). Charred corn. From pelvis of skeleton 194, embankment of sink hole.

Fig. 7 (20-437). Charred corn cob. From general diggings of mound 1.

Fig. 8 (20-1303b). Charred beans. From pelvis of skeleton 194, embankment of sink hole.

Fig. 9 (20-474). Charred hickory nut. From skeleton 32, mound 1.

Fig. 10 (20-1310). Charred walnut. From pelvis of skeleton 194, embankment of sink hole.



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PLATE XX. IMPLEMENTS FOR SECURING FOOD — POINTS CHIPPED FROM STONE.

Fig. 1 (20-1116a). Crudely chipped point of stone, possibly a reject. From general diggings of camp trench.

Fig. 2 (20-44a). Chipped point of yellowish gray chalcedony for arrow, spear, or knife. From surface of farm.

Fig. 3 (20-187a). Chipped point of mottled red and brown chalcedony for arrow, spear, or knife. From general diggings of mound 1.

Fig. 4 (20-583a). Chipped point of gray chalcedony, for arrow, spear, or knife, bearing mineral deposit. From general diggings of mound 2.

Fig. 5 (20-1196). Large chipped point of brown jasper for spear or knife, bearing mineral deposit. From near left hand of skeleton 5, camp trench.

Fig. 6 (20-82a). Chipped point of light brownish gray chalcedony bearing mineral deposit, for arrow or drill. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 7 (20-751). Chipped point of dark gray chalcedony for arrow. From general diggings of mound 2.

Fig. 8 (20-44b). Chipped point of yellowish chalcedony for arrow. From surface of farm.

Fig. 9 (20-189a). Crudely serrated chipped point of fine grained quartzite, for arrow. From general diggings of mound 1.

Fig. 10 (20-189b). Serrated finely chipped point of yellowish chert for arrow. From general diggings of mound 1.

Fig. 11 (20-586a). Chipped point of mottled red and yellow jasper for arrow or spear. The edge of the notches and base are rubbed smooth. From general diggings of mound 2.

Fig. 12 (20-188a). Chipped point of yellowish chalcedony. The edges of the notches are rubbed smooth, for arrow or spear. From general diggings of mound 1.

Fig. 13 (20-188b). Chipped point of banded gray chalcedony for arrow or spear. From general diggings of mound 1.

Fig. 14 (20-45a). Chipped point of mottled gray and yellowish chert for arrow or spear. From surface of farm.

Fig. 15 (20-188c). Chipped point of gray chalcedony. From general diggings of mound 1.

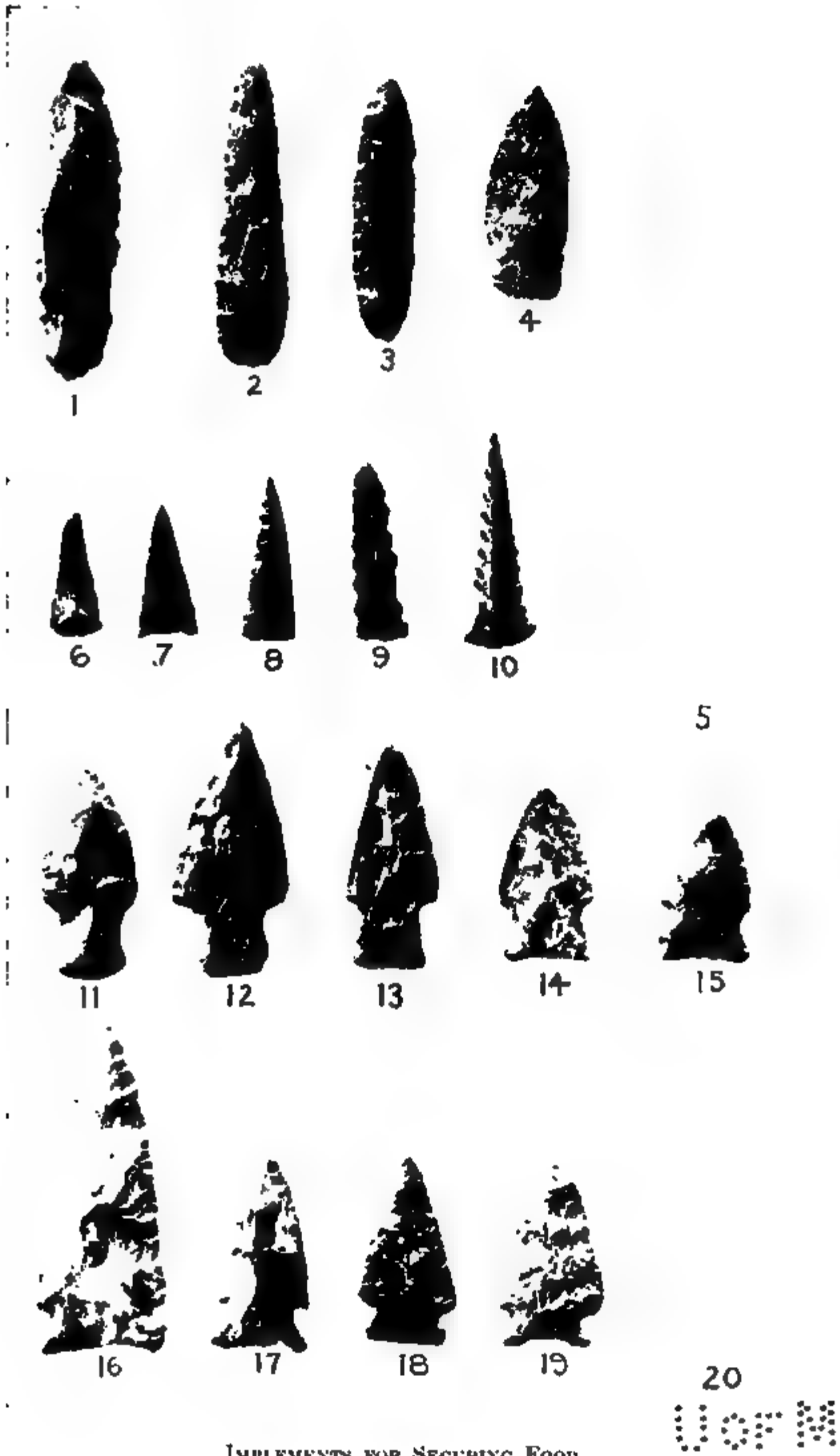
Fig. 16 (20-188d). Chipped point of banded chalcedony for arrow, knife, or spear, bearing a mineral deposit. From general diggings of mound 1.

Fig. 17 (20-83a). Chipped point of a banded brown jasper for arrow, spear, or knife. From the surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 18 (20-45b). Chipped point of mottled blue chert for arrow, spear, or knife. The edge of the base is rubbed smooth. From the surface of farm.

Fig. 19 (20-83b). Chipped point of light gray impure chalcedony for arrow, spear, or knife. From the surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 20 (20-586b). Chipped point of fine grained gray quartzite. The tang is broken off. From general diggings of mound 2.



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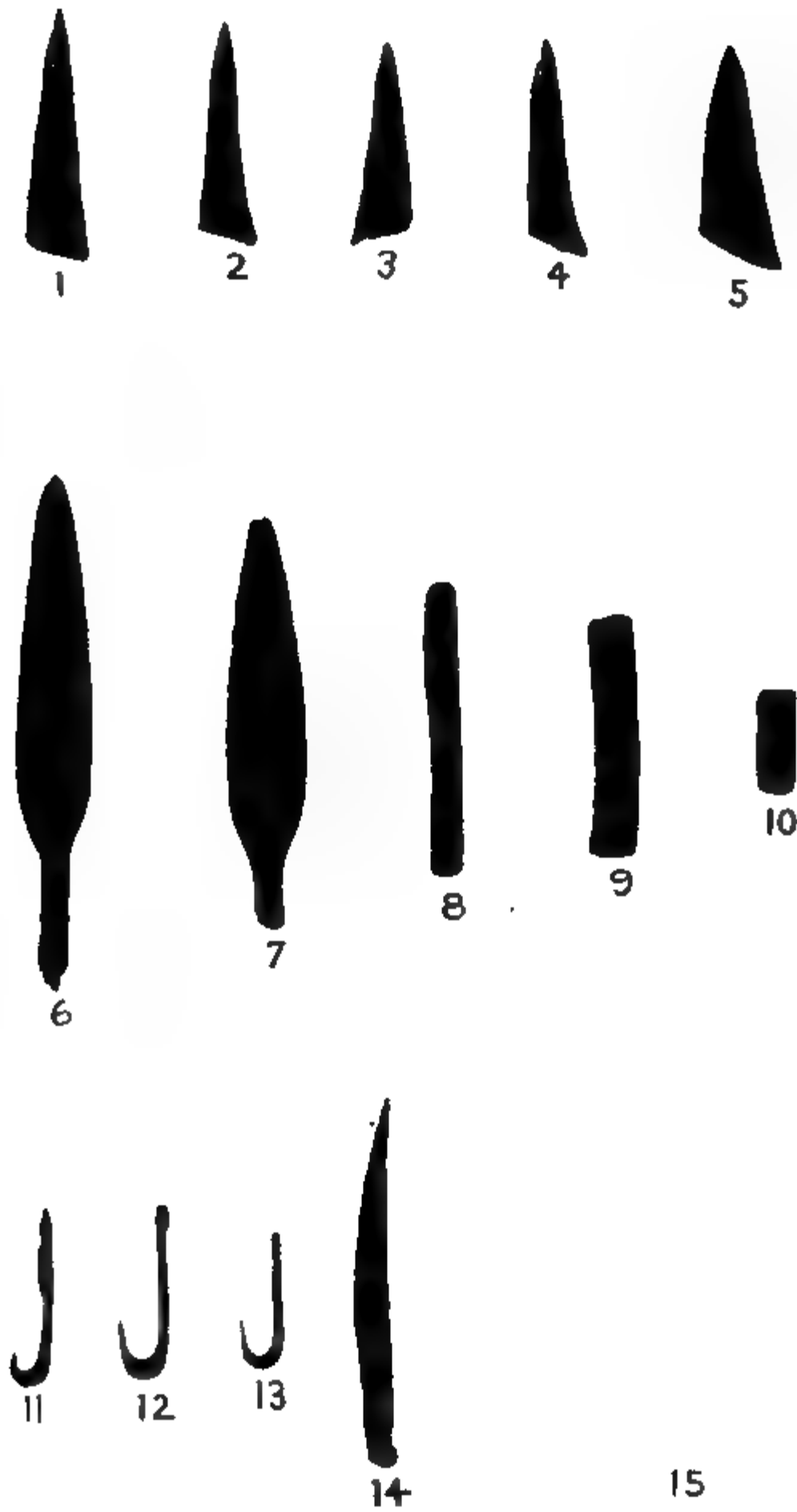
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**PLATE XXI. IMPLEMENTS FOR SECURING FOOD — POINTS OF ANTLER AND BONE, FISH
HOOKS OF BONE, IMPRESSION OF NETTING, ETC.**

- Fig. 1 (20-326a). Point made of antler, for arrow. From general diggings of mound 1.
Fig. 2 (20-326b). Point made of antler, for arrow. From general diggings of mound 1.
Fig. 3 (20-640a). Point made of antler, for arrow. From general diggings of mound 2.
Fig. 4 (20-326c). Point made of antler for arrow. From general diggings of mound 1.
Fig. 5 (20-977a). Point made of antler for arrow. From general diggings of mound 3.
Fig. 6 (20-1173). Fragment of a spatulate object made of bone. From general diggings of camp trench.
Fig. 7 (20-403a). Fragment of a spatulate object made of bone with an incision around the lower end. There is mineral deposit on the fragment. From general diggings of mound 1.
Fig. 8 (20-405a). Section cut from a whole bone the edges of which are polished, possibly part of a snare. From general diggings of mound 1.
Fig. 9 (20-712a). Section cut from a whole bone, possibly part of a snare. From general diggings of mound 2.
Fig. 10 (20-407a). Section cut from a whole bone the edges of which are polished, possibly part of a snare. From general diggings of mound 1.
Fig. 11 (20-730a). Grooved fish hook made of bone. From general diggings of mound 2.
Fig. 12 (20-898). Fish hook made of bone. From left pelvis of skeleton 105, mound 2.
Fig. 13 (20-1175). Grooved or incised fish hook made of bone. From general diggings of camp trench.
Fig. 14 (20-741). Sharpened splint from deer leg, possibly used as a fish hook. From general diggings of mound 2.
Fig. 15 (20-250). Fragment of pottery showing impression of net such as may have been used for fishing. From general diggings of mound 1.



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PLATE XXII. IMPLEMENTS USED IN PREPARING FOOD — POSSIBLY KNIVES AND SPOONS.

Fig. 1 (20-187b). Point chipped from light gray chert, possibly a knife. From general diggings of mound 1.

Fig. 2 (20-144a). Chipped disc of limestone, possibly a knife or skin scraper. From general diggings of mound 1.

Fig. 3 (20-126). Fragment of limestone chipped to an edge, possibly a chopping knife or skin scraper. From general diggings of mound 1.

Fig. 4 (20-578a). Oblong piece of limestone chipped to an edge, possibly a knife or skin scraper. From general diggings of mound 2.

Fig. 5 (20-931a). Unio shell with broken perforation and bearing mineral deposit, possibly a spoon. From general diggings of mound 2.

Fig. 6 (20-933a). Unio shell sharpened to a point probably by use as a spoon. From general diggings of mound 2.

Figure 1 consists of three diagrams labeled (a), (b), and (c), each showing a different type of interlocking structure. Diagram (a) shows a single chain of interlocking units, where each unit is represented by a small circle with a dot in the center, and the units are connected by lines. Diagram (b) shows two chains of interlocking units, where each chain is a separate structure. Diagram (c) shows a single chain of interlocking units, but with a cross-linking unit that connects to two other units in the chain.

PLATE XXIII. OBJECTS USED IN PREPARING FOOD — CHARCOAL AND POTTERY.

Fig. 1 (20-436a). Charcoal. From general diggings of mound 1.

Fig. 2 (20-242a). Fragment of pottery bearing soot and suggesting that cooking was done over open fires. From general diggings of mound 1.

Fig. 3 (20-606). Fragment of pottery sieve with punched holes. From general diggings of mound 2.

Fig. 4 (20-1128a). Fragment of pottery sieve with drilled holes. From general diggings of camp trench.



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PLATE XXIV. POTTERY -- TEMPERING AND MANUFACTURE.

Fig. 1 (20-247a). Potsherd showing shell tempering material. From general diggings of mound 1.

Fig. 2 (20-604a). Potsherd showing cracked surface. From general diggings of mound 2.

Fig. 3 (20-238a). Portion of a pot rim of rough ware. From general diggings of mound 1.

Fig. 4 (20-240a). Portion of a pot rim with punched perforation probably for suspension. From general diggings of mound 1.

Fig. 5 (20-256a). Portion of a pot rim showing drilled perforation probably for suspension. From general diggings of mound 1.

Fig. 6 (20-256b). Portion of a pot rim showing large modeled perforation probably for suspension. From general diggings of mound 1.

Fig. 7 (20-630a). Pot handle showing method of attachment. From general diggings of mound 2.

Fig. 8 (20-612a). Portion of a pot rim showing fold of clay and small lug. From general diggings of mound 2.

Fig. 9 (20-53a). Portion of a pot rim showing small lug. From surface of farm.

Fig. 10 (20-227). Fragment of pot rim showing lug made up of two horizontal ridges. From general diggings of mound 1.

Fig. 11 (20-630b). Fragment of a pot rim. From general diggings of mound 2.

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PLATE XXV. POTTERY — SHOWING TRACES OF MANUFACTURE.

Fig. 1 (20-615). Potsherd showing impression of fine netting. From general diggings of mound 2.

Fig. 2 (20-242b). Potsherd showing impression of netting. From general diggings of mound 1.

Fig. 3 (20-240b). Potsherd showing impression of cord wrapped paddle. From general diggings of mound 1.

Fig. 4 (20-242c). Potsherd showing impression of cord wrapped paddle partly smoothed down before firing. From general diggings of mound 1.

Fig. 5 (20-601a). Potsherd showing lines apparently modeled to represent cord markings. From general diggings of mound 2.

Fig. 6 (20-601b). Potsherd showing impression of carved paddle. From general diggings of mound 2.

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PLATE XXVI. POTTERY -- RIMS WITH LUGS.

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| Fig. 1 (20-614). | From general diggings of mound 2. |
| Fig. 2 (20-216a). | From general diggings of mound 1. |
| Fig. 3 (20-220). | From general diggings of mound 1. |
| Fig. 4 (20-613a). | From general diggings of mound 2. |
| Fig. 5 (20-613b). | From general diggings of mound 2. |
| Fig. 6 (20-1126a). | From general diggings of camp trench. |
| Fig. 7 (20-1047a). | From general diggings of mound 5. |
| Fig. 8 (20-221). | From general diggings of mound 1 |

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PLATE XXVII. POTTERY — RIMS WITH LUGS.

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| Fig. 1 (20-215a). | From general diggings of mound 1. |
| Fig. 2 (20-1126b) | From general diggings of camp trench. |
| Fig. 3 (20-215b). | From general diggings of mound 1 |
| Fig. 4 (20-261a). | From general diggings of mound 1. |
| Fig. 5 (20-223a). | From general diggings of mound 1 |
| Fig. 6 (20-1126c). | From general diggings of camp trench. |
| Fig. 7 (20-1126d). | From general diggings of camp trench. |
| Fig. 8 (20-214a). | From general diggings of mound 1 |

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POTTERY - RIMS WITH LUGS.
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PLATE XXVIII. POTTERY -- RIMS WITH LUGS.

- Fig. 1 (20-1224). From general diggings among hillside graves.
Fig. 2 (20-1308a). From over grave 194, embankment of sink hole.
Fig. 3 (20-224a). From general diggings of mound 1.
Fig. 4 (20-226). From general diggings of mound 1.
Fig. 5 (20-611). From general diggings of mound 2.
Fig. 6 (20-225). From general diggings of mound 1.
Fig. 7 (20-610a). From general diggings of mound 2.
Fig. 8 (20-609a). From general diggings of mound 2.

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PLATE XXVI. POTTERY — RIMS WITH LUGS.

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| Fig. 1 (20-614). | From general diggings of mound 2. |
| Fig. 2 (20-216a). | From general diggings of mound 1. |
| Fig. 3 (20-220). | From general diggings of mound 1. |
| Fig. 4 (20-613a). | From general diggings of mound 2. |
| Fig. 5 (20-613b). | From general diggings of mound 2. |
| Fig. 6 (20-1126a). | From general diggings of camp trench. |
| Fig. 7 (20-1047a). | From general diggings of mound 5. |
| Fig. 8 (20-221). | From general diggings of mound 1. |

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PLATE XXVII. POTTERY — RIMS WITH LUGS.

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| Fig. 1 (20-215a). | From general diggings of mound 1. |
| Fig. 2 (20-1126b) | From general diggings of camp trench. |
| Fig. 3 (20-215b). | From general diggings of mound 1. |
| Fig. 4 (20-261a). | From general diggings of mound 1. |
| Fig. 5 (20-223a). | From general diggings of mound 1. |
| Fig. 6 (20-1126c). | From general diggings of camp trench. |
| Fig. 7 (20-1126d). | From general diggings of camp trench. |
| Fig. 8 (20-214a). | From general diggings of mound 1. |

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PLATE XXVIII. POTTERY--RIMS WITH LUGS.

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| Fig. 1 (20-1224). | From general diggings among hillside graves. |
| Fig. 2 (20-1308a). | From over grave 194, embankment of sink hole. |
| Fig. 3 (20-224a). | From general diggings of mound 1. |
| Fig. 4 (20-226). | From general diggings of mound 1. |
| Fig. 5 (20-611). | From general diggings of mound 2. |
| Fig. 6 (20-225). | From general diggings of mound 1. |
| Fig. 7 (20-610a). | From general diggings of mound 2. |
| Fig. 8 (20-609a). | From general diggings of mound 2. |

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PLATE XXVIII. POTTERY — RIMS WITH LUGS.

- Fig. 1 (20-1224).** From general diggings among hillside graves.
Fig. 2 (20-1308a). From over grave 194, embankment of sink hole.
Fig. 3 (20-224a). From general diggings of mound 1.
Fig. 4 (20-226). From general diggings of mound 1.
Fig. 5 (20-611). From general diggings of mound 2.
Fig. 6 (20-225). From general diggings of mound 1.
Fig. 7 (20-610a). From general diggings of mound 2.
Fig. 8 (20-609a). From general diggings of mound 2.

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PLATE XXIX. POTTERY — HANDLES.

- Fig. 1 (20-194). From general diggings of mound 1.**
Fig. 2 (20-199a). From general diggings of mound 1.
Fig. 3 (20-207). From general diggings of mound 1.
Fig. 4 (20-206). From general diggings of mound 1.

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PLATE XXX. POTTERY — HANDLES.

- Fig. 1 (20-621).** From general diggings of mound 2.
Fig. 2 (20-592a). From general diggings of mound 2.
Fig. 3 (20-211a). From general diggings of mound 1.
Fig. 4 (20-211b). From general diggings of mound 1.
Fig. 5 (20-261b). From general diggings of mound 1.
Fig. 6 (20-213). From general diggings of mound 1.
Fig. 7 (20-214a) From general diggings of mound 1.



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PLATE XXXI. TOOLS USED BY MEN — CELTS.

Fig. 1 (20-529a). Symmetrical celt made of diorite bearing mineral deposit. From general diggings of mound 2.

Fig. 2 (20-121a). Symmetrical celt made of stone bearing mineral deposit, also showing peck marks. From general diggings of mound 1.

Fig. 3 (20-529b). Symmetrical celt ground out of stone. From general diggings of mound 2.

Fig. 4 (20-957). Asymmetrical celt ground out of stone. From general diggings of mound 3.

Fig. 5 (20-847). Asymmetrical celt ground out of diabase. From right of skeleton 80, mound 2.

Fig. 6 (20-74). Asymmetrical celt made of stone. From the surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 7 (20-529c). Very asymmetrical celt or adze made of diabase bearing mineral deposit. From general diggings of mound 2.

Fig. 8 (20-121b). Symmetrical celt chipped, pecked, and ground out of stone bearing mineral deposit. From general diggings of mound 1.

Fig. 9 (20-120). Asymmetrical celt chipped out of brown jasper. From general diggings of mound 1.

Fig. 10 (20-311a). Asymmetrical celt or adze made of antler. From general diggings of mound 1.

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PLATE XXXII. TOOLS USED BY MEN — HAMMERS AND PITTED STONES.

Fig. 1 (20-1092a). Pebble chipped and battered from use as a hammer. From general diggings of camp trench.

Fig. 2 (20-559a). Pebble chipped and battered from use as a hammer, bearing mineral deposit. From general diggings of mound 2.

Fig. 3 (20-558a). Pebble battered in facets, from use as a hammer. From general diggings of mound 2.

Fig. 4 (20-533a). Hammerstone slightly pitted on each side. From general diggings of mound 2.

Fig. 5 (20-1090a). Hammerstone deeply pitted on each side. From general diggings of camp trench.

Fig. 6 (20-6). Hammerstone having double pits on each side. From surface of farm.

Fig. 7 (20-18). Fragment of limestone bearing pecked pit. From surface of farm.

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**PLATE XXXIII. TOOLS USED BY MEN — WHETSTONES, GROOVED STONES, KNIVES,
DRILLS, ETC.**

Fig. 1 (20-567a). Burned whetstone made of gritstone. From general diggings of mound 2.

Fig. 2 (20-955). Whetstone of celt shape made of gray sandstone. From general diggings of mound 3.

Fig. 3 (20-27a). Grooved fragment of light brown sandstone, probably an arrow-shaft smoother. From surface of farm.

Fig. 4 (20-169a). Incised fragment of light brown sandstone, probably used for sharpening bone awls and similar objects. From general diggings of mound 1.

Fig. 5 (20-564). Fragment of gray limestone of sub-triangular pyramidal form bearing a longitudinal groove in one side, possibly an arrow-shaft smoother or for sharpening bone awls and similar objects. From general diggings of mound 2.

Fig. 6 (20-28). Fragment of purplish brown sandstone resembling one end of an arrow-shaft smoother of semi-cylindrical form with rounded ends and having a longitudinal groove in the middle of the flat side. From surface of farm.

Fig. 7 (20-765). Fragment of a chisel made of the metatarsus of a deer. From below south top stone of grave 60, mound 2.

Fig. 8 (20-1145). Cylindrical object with pointed end made of antler. From general diggings of camp trench.

Fig. 9 (20-654a). Cylindrical object of antler, possibly a flaker. From general diggings of mound 2.

Fig. 10 (20-653). Section of antler with ends rounded and ridge scraped smooth, possibly a flaker or unfinished knife handle. From general diggings of mound 2.

Fig. 11 (20-389a). Lower incisor of a beaver with the base cut off by grooving and breaking and the inner surface gouged out, probably used as a knife. From general diggings of mound 1.

Fig. 12 (20-389b). Lower incisor of a beaver with the base cut off by grooving and breaking and the inner surface gouged out, probably used as a knife. From general diggings of mound 1.

Fig. 13 (20-707a). Lower incisor of a beaver with the base cut off by grooving and breaking, the inner surface gouged out and the other surfaces highly polished from use, probably as a knife. From general diggings of mound 2.

Fig. 14 (20-708). The exterior portion of the cutting edge of a beaver tooth cut out along the sides and base, probably used as a knife. From general diggings of mound 2.

Fig. 15 (20-583b). Point chipped from yellowish chert, the end of which is rubbed smooth possibly from use as a knife. From general diggings of mound 2.

Fig. 16 (20-1219a). Chip of chalcedony such as was probably used in cutting. From among general diggings of the hillside graves.

Fig. 17 (20-190a). Point for a drill chipped from mottled gray and yellowish chalcedony. From general diggings of mound 1.

Fig. 18 (20-807). Point for a drill chipped from gray chert. From general diggings of mound 2.

Fig. 19 (20-190b). Point for drill chipped from pink chalcedony. From general diggings of mound 1.

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TOOLS USED BY WOMEN.
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PLATE XXXIV. TOOLS USED BY WOMEN -- SCRAPERS, AWLS, AND NEEDLES.

Fig. 1 (20-45c). Symmetrical chipped point of pinkish chalcedony rubbed smooth probably from use as a skin scraper. From surface of farm.

Fig. 2 (20-315). Skin scraper made of the metatarsus of a deer. From general diggings of mound 1.

Fig. 3 (20-348a). Awl made of the proximal part of the tarsometatarsus of a wild turkey. From general diggings of mound 1.

Fig. 4 (20-681). Awl made of the proximal part of the tarsometatarsus of a wild turkey ornamented with six notches and highly polished from use. From general diggings of mound 2.

Fig. 5 (20-675). Awl with highly polished point made of the distal part of the tibio-tarsus of a wild turkey. From general diggings of mound 2. (See Plate XL, Fig. 14.)

Fig. 6 (20-354a). Awl, highly polished from use, made of the proximal part of the tibio-tarsus of a wild turkey. From general diggings of mound 1.

Fig. 7 (20-676). Awl, highly polished from use, made of the proximal part of the tibio-tarsus of a wild turkey, and ornamented with eight notches. From general diggings of mound 2.

Fig. 8 (20-722a). Awl made of a fragment of a long bone of a quadruped. From general diggings of mound 2.

Fig. 9 (20-360a). Awl or unfinished needle made of a fragment of the long bone of a bird, bearing mineral deposit. From general diggings of mound 1.

Fig. 10 (20-400). Fragment of an object made of bone, probably an awl. From general diggings of mound 1.

Fig. 11 (20-740a). Splint from the leg of a deer, possibly used as an awl. From general diggings of mound 2.

Fig. 12 (20-1151). Awl made from the distal end of the metatarsus of a deer. From general diggings of camp trench. (See Plate XL, Fig. 4.)

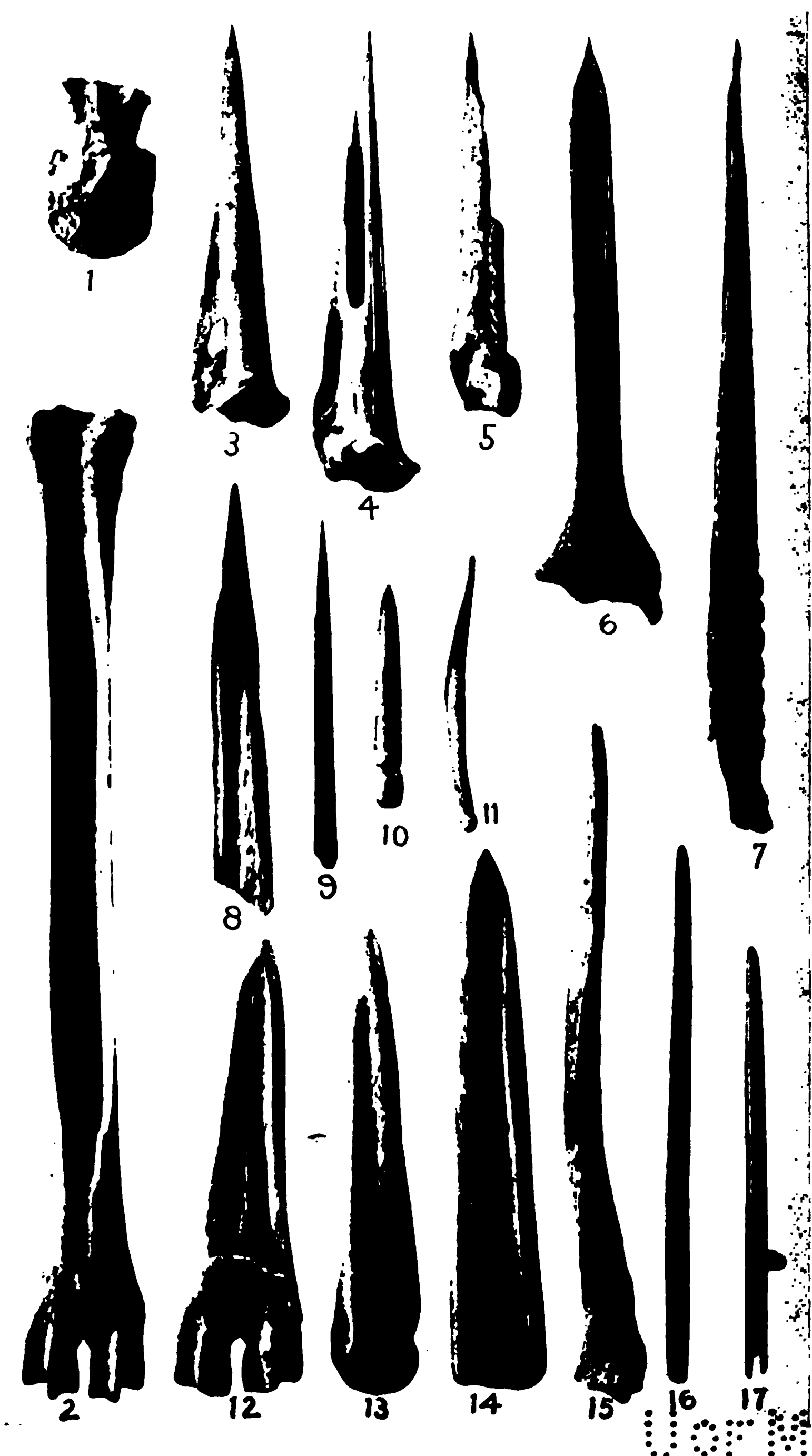
Fig. 13 (20-362a). Awl made from the longitudinal half of the distal end of the metatarsus of a deer. From general diggings of mound 1.

Fig. 14 (20-832). Awl made of about one half of the proximal end of the metatarsus of a deer. From left hand of skeleton 74, mound 2.

Fig. 15 (20-722b). Awl made of a bone. From general diggings of mound 2.

Fig. 16 (20-1171). Highly polished object made of a portion of the long bone of a bird, possibly an unfinished needle. From general diggings of camp trench.

Fig. 17 (20-723a). Needle made of bone with an eye. From general diggings of mound 2.



TOOLS USED BY WOMEN.
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PLATE XXXV. TOOLS USED BY WOMEN — AWLS.

Fig. 1 (20-670a). Awl made of the proximal part of the ulna of a young elk. From general diggings of mound 2.

Fig. 2 (20-667a). Highly polished awl made of the proximal part of the ulna of a deer. From general diggings of mound 2.

Fig. 3 (20-668a). Awl made of the proximal part of the ulna of a deer with the base smoothed off. From general diggings of mound 2.

Fig. 4 (20-346a). Awl made of pubis bone of the black bear. From general diggings of mound 1.

Fig. 5 (20-693). Awl made of the pathological ulna of the black bear. From general diggings of mound 2.

Fig. 6 (20-347). Awl made of the ulna of a lynx. From general diggings of mound 1.



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TOOLS USED BY WOMEN.
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PLATE XXXVI. PROCESSES OF MANUFACTURE -- RUBBING AND CUTTING.

Fig. 1 (20-1103a). Brown sandstone grinding stone. From general diggings of camp trench.

Fig. 2 (20-122a). Stone celt with ground point. From general diggings of mound 1.

Fig. 3 (20-232a). Disc made of a fragment of pottery with ground edge. From general diggings of mound 1.

Fig. 4 (20-654b). Cylindrical piece of antler with surface probably ground. From general diggings of mound 2.

Fig. 5 (20-361a). Awl made of the proximal part of the ulna of a deer, with ground point. From general diggings of mound 1.

Fig. 6 (20-933b). A spoon-like object made of unio shell with ground or worn edge. From general diggings of mound 2.

Fig. 7 (20-42a). Flake of chalcedony such as was probably used for cutting. From surface of farm.

Fig. 8 (20-540a). Stone showing cut lines. From general diggings of mound 2.

Fig. 9 (20-266). Potsherd bearing handle and showing cut edge. From general diggings of mound 1.

Fig. 10 (20-942). Shell showing two cut edges. From general diggings of mound 2.

Fig. 11 (20-425). Shell with cut edge. From general diggings of mound 1.

Fig. 12 (20-1150). Deer bone showing transverse cutting. From general diggings of camp trench.

Fig. 13 (20-104). Bird bone showing transverse and longitudinal cutting. From general diggings of mound 1.

Fig. 14 (20-412). Bird bone showing transverse and longitudinal cutting. From general diggings of mound 1.

Fig. 15 (20-419a). Rectangular piece cut out of bone. From general diggings of mound 1.

Fig. 16 (20-1000). Ulna of deer showing where end is cut off. From general diggings of mound 3.

Fig. 17 (20-385a). Canine tooth of a bear showing cut grooving. From general diggings of mound 1.

Fig. 18 (20-384). Tip cut from canine tooth of a bear. From general diggings of mound 1.

Fig. 19 (20-635a). Prong of antler showing transverse cutting. From general diggings of mound 2.

Fig. 20 (20-648a). Piece of antler showing longitudinal cutting. From general diggings of mound 2.

Fig. 21 (20-980). Piece of antler showing cut edge. From general diggings of mound 3.



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PLATE XXXVII. PROCESSES OF MANUFACTURE — DRILLING, PUNCHING, CHIPPING, AND PECKING.

- Fig. 1 (20-159a). Sandstone with drilled hole. From general diggings of mound 1.
Fig. 2 (20-179). Slate showing drilled hole. From general diggings of mound 1.
Fig. 3 (20-234a). Pottery showing drilling. From general diggings of mound 1.
Fig. 4 (20-426a). Shell showing drilling. From general diggings of mound 1.
Fig. 5 (20-739). Bone showing drilling. From general diggings of mound 2.
Fig. 6 (20-699). Canine tooth of a black bear showing drilling. From general diggings of mound 2.
Fig. 7 (20-393a). Canine tooth of a small carnivore showing drilling. From general diggings of mound 1.
Fig. 8 (20-395a). Incisor of an elk showing drilling. From general diggings of mound 1.
Fig. 9 (20-700). Canine tooth of an elk showing drilling. From general diggings of mound 2.
Fig. 10 (20-666). Fragment of turtle shell showing drilling. From general diggings of mound 2.
Fig. 11 (20-312a). Fragment of antler showing drilling. From general diggings of mound 1.
Fig. 12 (20-961a). Point for drill made of yellowish chalcedony. From general diggings of mound 3.
Fig. 13 (20-40a). Longitudinal fragment of limestone pipe showing cores left by hollow drill. From surface of farm. (See Plate XLVI, Fig. 12.)
Fig. 14 (20-51a). Fragment of pottery showing punched holes. From surface of farm.
Fig. 15 (20-583c). Leaf-shaped object of chalcedony showing chipping. From general diggings of mound 2.
Fig. 16 (20-971a). Disc of pottery showing chipping. From general diggings of mound 3.
Fig. 17 (20-123a). Poll of celt showing pecking. From general diggings of mound 1.



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**PLATE XXXVIII. MANUFACTURE -- POINTS CHIPPED OUT OF STONE AND POINTS RUBBED
OUT OF ANTLER.**

Fig. 1 (20-579a). Fragment of chalcedony from which pieces have been chipped. From general diggings of mound 2.

Fig. 2 (20-130a). Hammer, possibly used in chipping. From general diggings of mound 1.

Fig. 3 (20-42b, c). Chips. From surface of farm.

Fig. 4 (20-581a). Unfinished object made by chipping with a hammer pebble such as was finished by flaking. From general diggings of mound 2.

Fig. 5 (20-416a). Cylinder of antler possibly used as a flaker. From general diggings of mound 1.

Fig. 6 (20-42d, e). Flakes. From surface of farm.

Fig. 7 (20-189c). Finished serrated point for an arrow made of gray chalcedony by chipping and flaking. From general diggings of mound 1.

Fig. 8 (20-327a). Prong broken from antler. From general diggings of mound 1.

Fig. 9 (20-580a). Flake of chert such as may have been used for cutting antler. From general diggings of mound 2.

Fig. 10 (20-825). Prong broken from antler, with transverse cut started. From eighteen inches above skeleton 70, mound 2.

Fig. 11 (20-324a). Tip of antler showing transverse cutting. From general diggings of mound 1.

Fig. 12 (20-320a, 636). Prong of antler and tip removed by transverse cutting and breaking. From general diggings of mounds 1 and 2.

Fig. 13 (20-637). Tip cut and broken from prong of deer antler. From general diggings of mound 2.

Fig. 14 (20-565). Sandstone such as was used for sharpening antler. From general diggings of mound 2.

Fig. 15 (20-638). Tip cut and broken from antler and sharpened on sandstone or by scraping with a stone flake. From general diggings of mound 2.

Fig. 16 (20-588a). Drill point chipped from chalcedony such as was used in drilling hole in base of antler tip. From general diggings of mound 2.

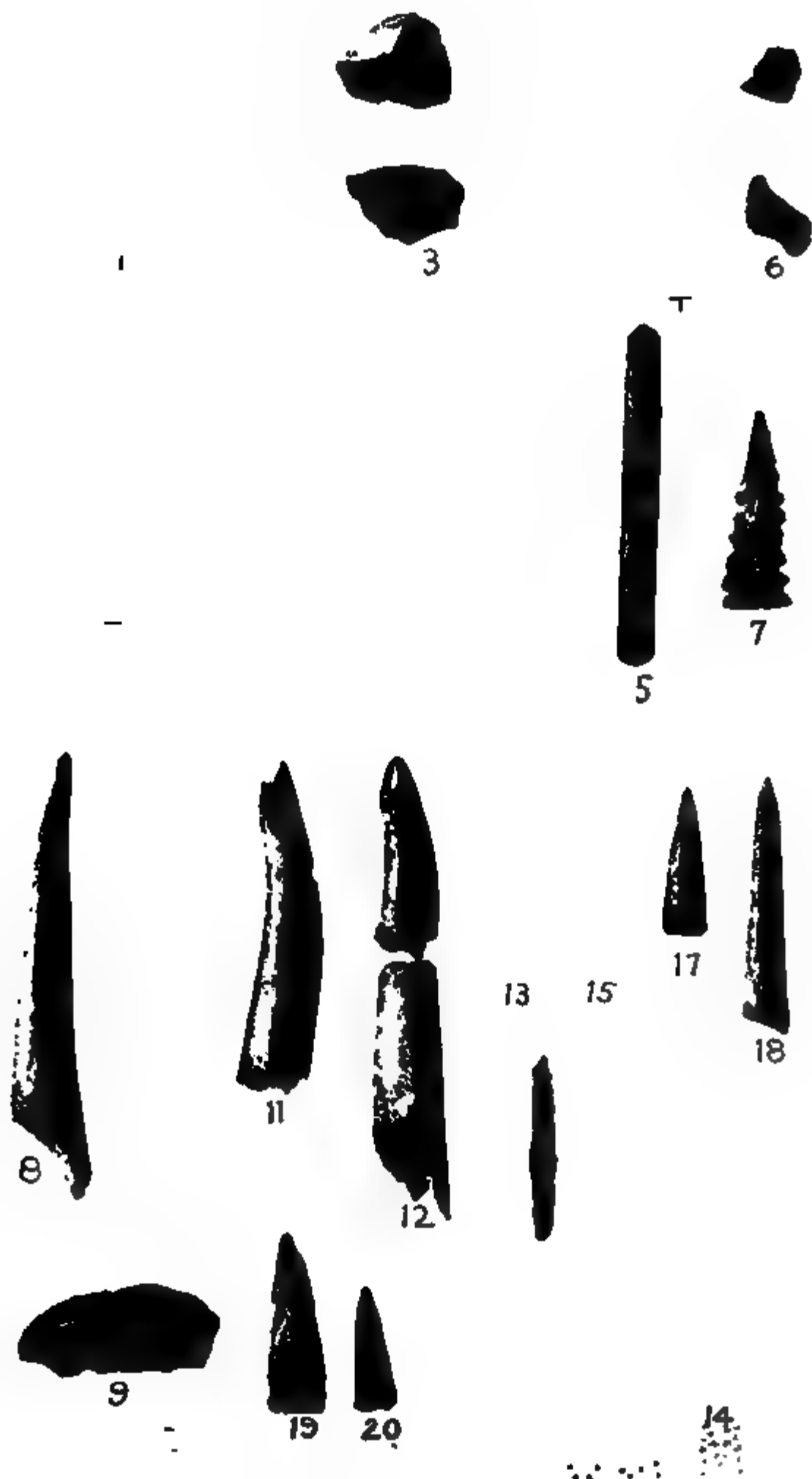
Fig. 17 (20-977b). Tip of antler cut and broken from prong sharpened on sandstone and drilled in base for the reception of an arrow-shaft. From general diggings of mound 3.

Fig. 18 (20-1142a). Finished arrow point made of antler and cut around the base with stone flake to form barb. From general diggings of camp trench.

Fig. 19 (20-1142b). Tip of antler showing whittling with such an object as a flake of stone. From general diggings of camp trench.

Fig. 20 (20-1142c). Tip of antler showing whittling with such an object as a flake of stone. From general diggings of camp trench.

Fig. 21 (20-1142d). Tip of antler showing striations of a drill. From general diggings of camp trench.



MANUFACTURE.
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PLATE XXXIX. MANUFACTURE — FISH HOOKS OF BONE AND CELTS OF ANTLER.

Fig. 1 (20-749a). Humerus of a turkey. From general diggings of mound 2.

Fig. 2 (20-186a). Chip of chert such as may have been used for cutting bone of a turkey. From general diggings of mound 1.

Fig. 3 (20-365a). Humerus of a turkey from which rectangular piece has been cut. From general diggings of mound 1.

Fig. 4 (20-365b). Humerus of a turkey from which rectangular piece has been cut. From general diggings of mound 1.

Fig. 5 (20-738a). Piece cut from bird bone. From general diggings of mound 2.

Fig. 6 (20-190c). Drill point chipped from chert, such as may have been used for drilling bone. From general diggings of mound 1.

Fig. 7 (20-728a). Fragment of bone showing where ends have been drilled. From general diggings of mound 2.

Fig. 8 (20-730b). Fish hook made of piece of bone by drilling holes in ends and cutting. From general diggings of mound 2.

Fig. 9 (20-730c). Fish hook made of piece of bone by cutting out interior. From general diggings of mound 2.

Fig. 10 (20-366). Piece of bone or antler rounded at the end with drilled pit in the center near this end and a scraped groove, possibly in process of manufacture into a fish hook. From general diggings of mound 1.

Fig. 11 (20-580b). Chip of chalcedony such as may have been used for cutting antler. From general diggings of mound 2.

Fig. 12 (20-298). Piece of antler grooved longitudinally probably with a chipped stone. From general diggings of mound 1.

Fig. 13 (20-138a). Piece of light brown sandstone possibly used for grinding antler. From general diggings of mound 1.

Fig. 14 (20-311b). Finished celt cut longitudinally from a piece of antler and ground smooth. From general diggings of mound 1.



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PLATE XL. MANUFACTURE -- SCRAPERS AND AWLS MADE OF BONE.

Fig. 1 (20-690a). Metacarpal of a deer. From general diggings of mound 2.

Fig. 2 (20-960a). Chip of jasper which may have been used for cutting bone. From general diggings of mound 3.

Fig. 3 (20-316a). Fragment of a scraper made from the metatarsus of a deer. From general diggings of mound 1.

Fig. 4 (20-1151). Awl made from the distal end of the metatarsus of a deer. From general diggings of camp trench. (See Plate xxxiv, Fig. 12.)

Fig. 5 (20-362b). Awl made of half of the distal end of the metatarsus of a deer. From general diggings of mound 1.

Fig. 6 (20-169b). Fragment of yellowish sandstone such as may have been used for grinding and sharpening bone. From general diggings of mound 1.

Fig. 7 (20-669a). Ulna of a deer. From general diggings of mound 2.

Fig. 8 (20-667b). Awl made of ulna of a deer. From general diggings of mound 2.

Fig. 9 (20-678a). Tarsometatarsus of a wild turkey. From general diggings of mound 2.

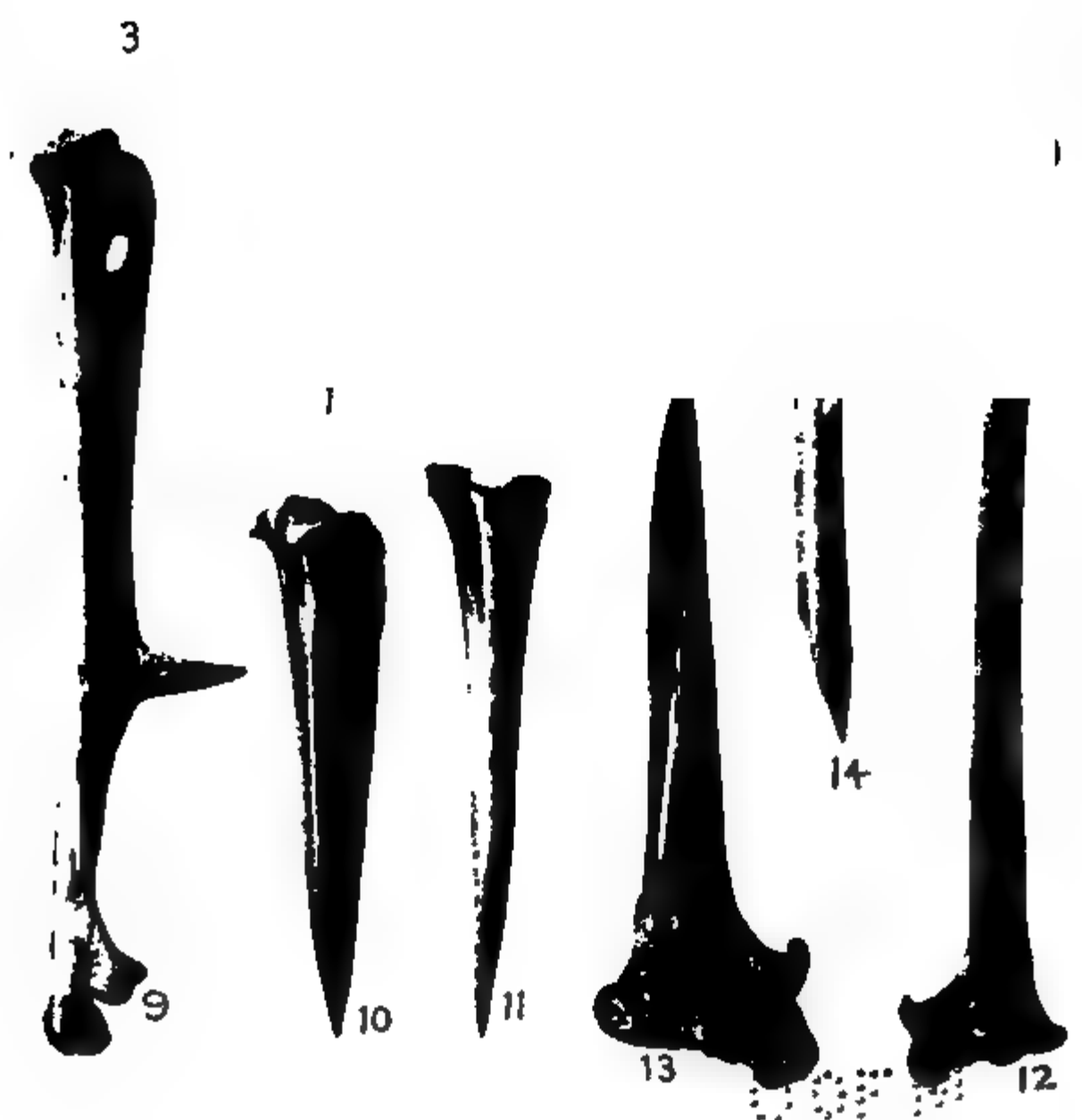
Fig. 10 (20-349a). Awl made of the tarsometatarsus of a wild turkey. From general diggings of mound 1.

Fig. 11 (20-352a). Awl made of the tarsometatarsus of a wild turkey ornamented with four notches. From general diggings of mound 1.

Fig. 12 (20-672a). Tibio-tarsus of a female wild turkey. From general diggings of mound 2.

Fig. 13 (20-674a). Awl made of the proximal end of the tibio-tarsus of a wild turkey. From general diggings of mound 2.

Fig. 14 (20-675). Awl made of the distal end of the tibio-tarsus of a wild turkey. From general diggings of mound 2.

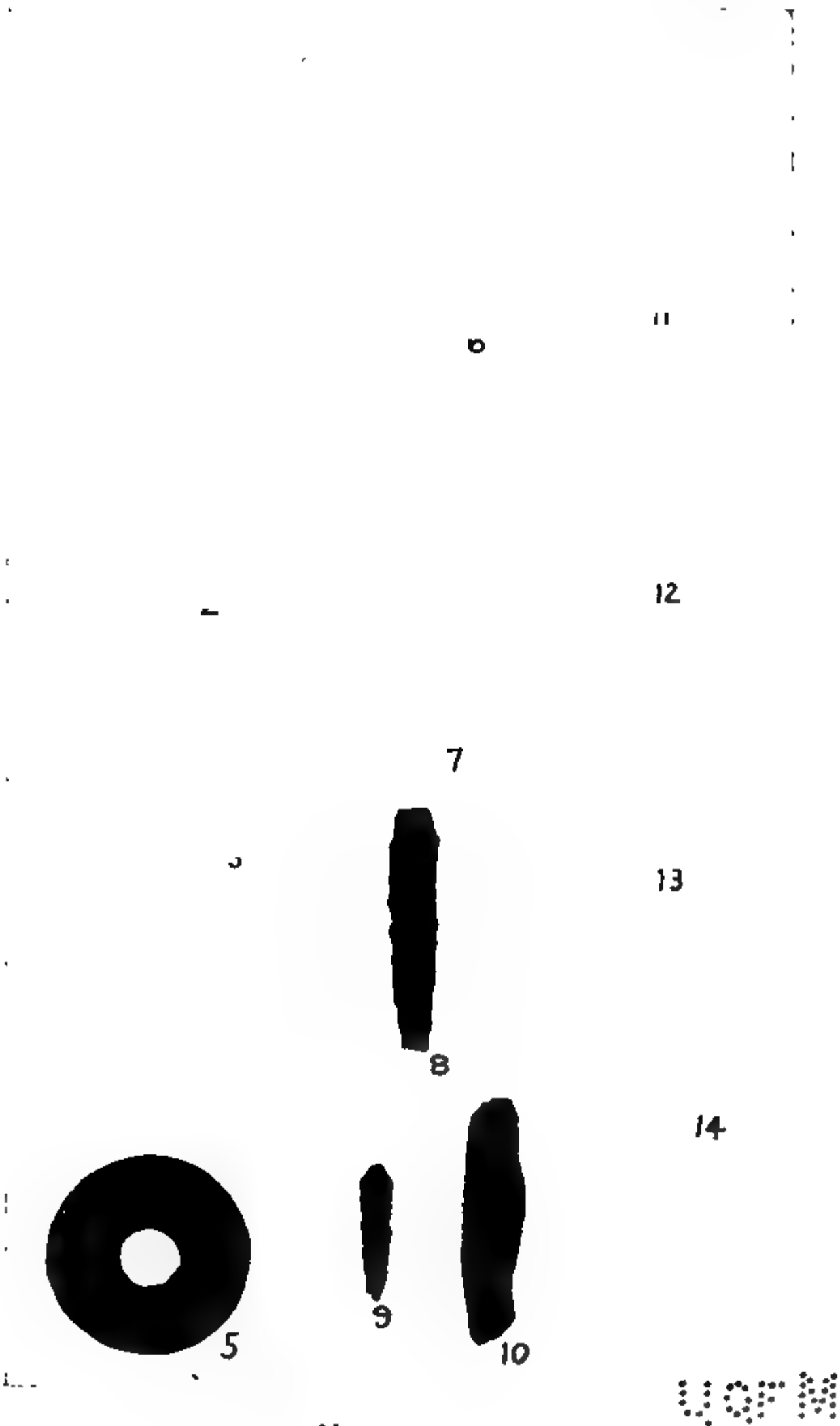


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PLATE XLI. MANUFACTURE — DISCS OF STONES AND POTTERY.

- Fig. 1 (20-138b). Piece of sandstone. From general diggings of mound 1.
- Fig. 2 (20-148a). Piece of sandstone chipped to disc shape. From general diggings of mound 1.
- Fig. 3 (20-157a). Piece of sandstone chipped to disc shape, roughly ground, and partly drilled. From general diggings of mound 1.
- Fig. 4 (20-553a). Piece of sandstone chipped to disc shape and drilled. From general diggings of mound 2. (See Plate XLIV, Fig. 17.)
- Fig. 5 (20-1097). Finished perforated disc of sandstone marked with lines and dots. From general diggings of camp trench.
- Fig. 6 (20-577). Celt chipped and ground from jasper. Such a stone may have been used to chip stone and pottery into discs. From general diggings of mound 2.
- Fig. 7 (20-137). Fine ground sandstone such as may have been used to smooth discs. From general diggings of mound 1.
- Fig. 8 (20-588b). Drill point chipped from chert such as may have been used for perforating discs. From general diggings of mound 2.
- Fig. 9 (20-588c). Small drill chipped from chalcedony such as may have been used for dotting discs. From general diggings of mound 2.
- Fig. 10 (20-902). Flake of jasper such as may have been used for marking discs. From general diggings of mound 2.
- Fig. 11 (20-2006). Fragment of pottery such as was chipped into discs. From surface near mounds on the farm of Sanford Mitchel, two miles southeast of May's Lick.
- Fig. 12 (20-624a). Fragment of pottery chipped into disc form. From general diggings of mound 2.
- Fig. 13 (20-232). Fragment of pottery chipped into disc form and having ground edges. From general diggings of mound 1.
- Fig. 14 (20-626). Fragment of pottery chipped into disc form, having ground edges and with perforation started. From general diggings of mound 2.
- Fig. 15 (20-627a). Finished perforated disc made of pottery. From general diggings of mound 2.



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PLATE XLII. MANUFACTURE — WHISTLES, BEADS, ETC., MADE OF BONE.

- Fig. 1 (20-713a). Bird bone with ends broken off. From general diggings of mound 2.
Fig. 2 (20-413). Whistle made of bird bone. From general diggings of mound 1.
Fig. 3 (20-961c). Drill point chipped from stone. From general diggings of mound 3.
Fig. 4 (20-685a). Penis bone of raccoon. From general diggings of mound 2.
Fig. 5 (20-1166). Penis bone of raccoon with base cut off and tip perforated. From general diggings of camp trench.
Fig. 6 (20-719a). Phalanx of deer. From general diggings of mound 2.
Fig. 7 (20-42f). Fragment of point chipped from chalcedony such as was used for cutting. From surface of farm.
Fig. 8 (20-961b). Drill point chipped from chalcedony such as was used for perforating. From general diggings of mound 3.
Fig. 9 (20-721a). Phalanx of deer with proximal end cut off and distal end perforated for use in ring and pin game. From general diggings of mound 2.
Fig. 10 (20-367). Tibia of small mammal. From general diggings of mound 1.
Fig. 11 (20-368). Tibia of small mammal from which end has been cut. From general diggings of mound 1.
Fig. 12 (20-709). Piece of long bone from which end has been cut, incised around in order to remove section for a bead. From general diggings of mound 2.
Fig. 13 (20-410a). End of long bone of a quadruped from which end has been cut, incised around in order to cut section for a bead. From general diggings of mound 1.
Fig. 14 (20-407b). Bead made of section cut from a bird bone. From general diggings of mound 1.
Fig. 15 (20-411a). Distal end of a humerus from which section has been cut. From general diggings of mound 1.
Fig. 16 (20-317). Distal end of metatarsus of deer from which section has been cut. From general diggings of mound 1.
Fig. 17 (20-960b). Chipped point made of jasper, such as may have been used for cutting bone. From general diggings of mound 3.



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PLATE XLIII GAMES - CYLINDERS, RING AND PIN, ASTRAGALUS AND DISCS OF POTTERY AND STONE.

- Fig. 1 (20-402a). Cylinder of antler. From general diggings of mound 1
 Fig. 2 (20-417a). Cylinder of antler. From general diggings of mound 1
 Fig. 3 (20-398a). Awl made of bone. From general diggings of mound 1.
 Fig. 4 (20-375a). Phalanx of an elk. From general diggings of mound 1
 Fig. 5 (20-379a). Phalanx of a deer. From general diggings of mound 1.
 Fig. 6 (20-379b). Phalanx of a deer. From general diggings of mound 1
 Fig. 7 (20-379c). Phalanx of a deer. From general diggings of mound 1.
 Fig. 8 (20-376a). Astragalus of a deer. From general diggings of mound 1.
 Fig. 9 (20-624b). Disc made of pottery. From general diggings of mound 2.
 Fig. 10 (20-232b). Disc made of pottery. From general diggings of mound 1.
 Fig. 11 (20-233a). Disc made of pottery. From general diggings of mound 1
 Fig. 12 (20-540c). Disc made of yellowish sandstone. From general diggings of mound 2.
 Fig. 13 (20-547). Disc made of yellowish sandstone pecked concavely on the reverse. From general diggings of mound 2
 Fig. 14 (20-144b). Disc chipped from gray limestone. From general diggings of mound 1.
 Fig. 15 (20-156). Disc made of limestone, convex on the reverse. From general diggings of mound 1.
 Fig. 16 (20-543). Disc made of limestone having hollow in the center and being convex on the reverse. From general diggings of mound 2.
 Fig. 17 (20-542). Disc made of stone, convex on the reverse. From general diggings of mound 2.



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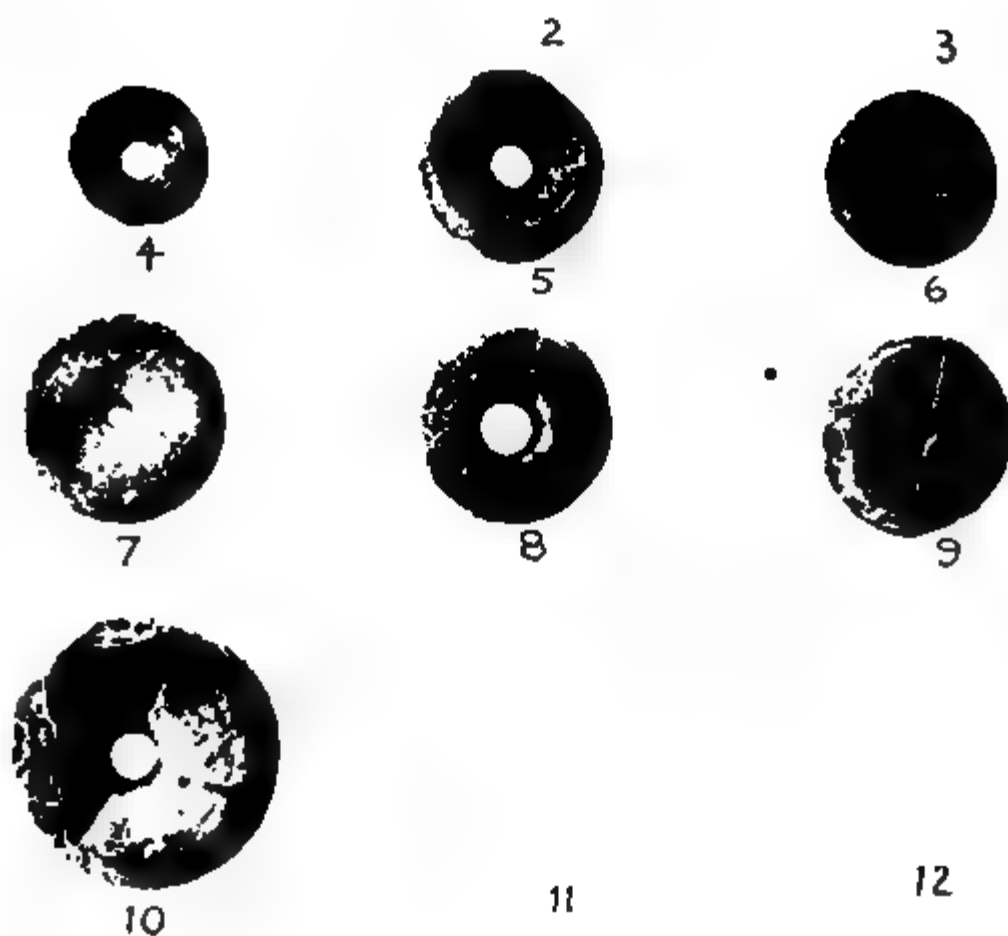
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PLATE XLIV. GAMES - DISCS MADE OF STONE.

- Fig. 1 (20-963a). Yellowish sandstone. From general diggings of mound 3.
Fig. 2 (20-75). Yellowish sandstone. From surface of farm. Presented by Col Frederick H. Bierbower.
Fig. 3 (20-964). Yellowish sandstone. From general diggings of mound 3.
Fig. 4 (20-549a). Yellowish sandstone. From general diggings of mound 2.
Fig. 5 (20-552a). Yellowish sandstone. From general diggings of mound 2.
Fig. 6 (20-1095a). Yellowish sandstone. From general diggings of camp trench.
Fig. 7 (20-549b). Limestone. From general diggings of mound 2.
Fig. 8 (20-551). Yellowish sandstone. From general diggings of mound 2.
Fig. 9 (20-80). Reddish sandstone. From surface of farm. Presented by Col Frederick H. Bierbower. (See Plate LII, Fig. 3.)
Fig. 10 (20-77). Yellowish sandstone. From surface of farm. Presented by Col. Frederick H. Bierbower. (See Plate LII, Fig. 4.)
Fig. 11 (20-555). Gray sandstone. From general diggings of mound 2. (See Plate LII, Fig. 6.)
Fig. 12 (20-162). Gray sandstone. From general diggings of mound 1.
Fig. 13 (20-545a). Reddish sandstone. From general diggings of mound 2.
Fig. 14 (20-157b). Yellow sandstone. From general diggings of mound 1.
Fig. 15 (20-541). Gray sandstone. From general diggings of mound 2.
Fig. 16 (20-540b). Reddish sandstone. From general diggings of mound 2. (See Plate LII, Fig. 2.)
Fig. 17 (20-553b). Yellow sandstone. From general diggings of mound 2. (See Plate XLII, Fig. 4.)
Fig. 18 (20-160). Yellow sandstone. From general diggings of mound 1.



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PLATE XIV. PIPES.

- Fig. 1 (20-1332).** Yellow sandstone. From general diggings over grave 196, in field.
- Fig. 2 (20-771).** Yellow sandstone bearing incised face. From near feet of skeleton 61, mound 2. (See Plate LII, Fig. 11.)
- Fig. 3 (20-1109).** Yellow sandstone. From general diggings of camp trench (See Plate LII, Fig. 1.)
- Fig. 4 (20-1110).** Limestone. From general diggings of camp trench.
- Fig. 5 (20-572a).** Yellow sandstone. From general diggings of mound 2.
- Fig. 6 (20-1111).** Limestone. From general diggings of camp trench.
- Fig. 7 (20-571).** Yellow sandstone. From general diggings of mound 2.
- Fig. 8 (20-1297).** Limestone. From right hand of skeleton 193, in field. (See Plate LIV, Fig. 12.)
- Fig. 9 (20-178).** Yellow sandstone. From general diggings of mound 1. (See Plate LII, Fig. 15.)
- Fig. 10 (20-176).** Yellowish sandstone bearing incised human face on reverse. From general diggings of mound 1. (See Plate LII, Fig. 10.)
- Fig. 11 (20-967).** Modeled in pottery. From general diggings of mound 3. (See Plate LVI, Fig. 10.)



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PLATE XLVI. PIPES - UNFINISHED AND BROKEN.

Fig. 1 (20-175). Cylinder of yellowish sandstone with dot for drilling of bowl. From general diggings of mound 1.

Fig. 2 (20-1333). Cylinder of yellowish sandstone. From general diggings over grave 196. In field.

Fig. 3 (20-173). Reddish sandstone, undrilled, bearing incised human face. From general diggings of mound 1. (See Plate LII, Fig. 12.)

Fig. 4 (20-38). Conoid form pecked from limestone with drilling for bowl begun. From surface of farm.

Fig. 5 (20-762). Monitor form, undrilled, pecked from limestone. From northwest corner of stone covers of skeleton 59, mound 2.

Fig. 6 (20-172). Monitor form, undrilled, pecked from limestone. From general diggings of mound 1.

Fig. 7 (20-570). Limestone, broken in process of manufacture. From general diggings of mound 2.

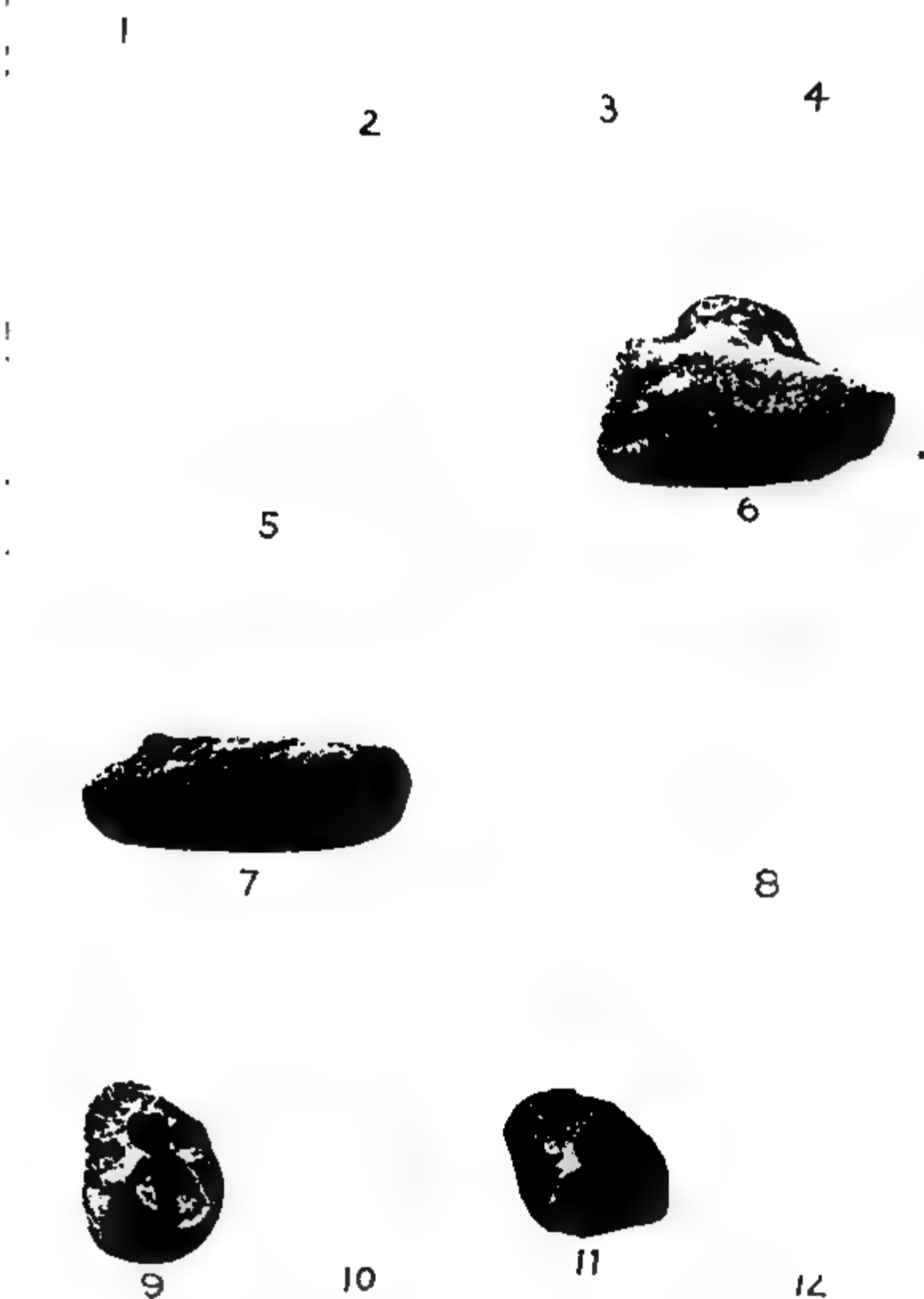
Fig. 8 (20-1279). Monitor form, undrilled, of yellowish sandstone bearing incised human form on base. From general diggings over grave 177, embankment of sink hole. (See Plate LII, Fig. 13.)

Fig. 9 (20-572b). Gray limestone. From general diggings of mound 2.

Fig. 10 (20-177). Yellowish sandstone. From general diggings of mound 1.

Fig. 11 (20-40b). Yellowish sandstone. From surface of farm.

Fig. 12 (20-40c). Limestone pipe. From surface of farm. (See Plate xxxvii, Fig. 13.)



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PIPES -- UNFINISHED AND BROKEN.
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PLATE XLVII. PIPES - UNFINISHED.

Fig. 1 (20-568). Yellowish sandstone marked for beginning of bowl. From general diggings of mound 2.

Fig. 2 (20-26a). Yellow sandstone marked for beginning of bowl and split longitudinally. From surface of farm.

Fig. 3 (20-569). Reddish sandstone with drilling begun for both bowl and stem. From general diggings of mound 2.

Fig. 4 (20-39). Limestone in which a bowl has been begun, apparently by pecking. From surface of farm.

Fig. 5 (20-170). Yellowish sandstone. From general diggings of mound 1.

Fig. 6 (20-37). Yellowish sandstone showing marks of pecking. From surface of farm.

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The diagrams illustrate the arrangement of particles in three states of matter:

- Solid:** Particles are closely packed in a regular, repeating pattern.
- Liquid:** Particles are closely packed but arranged in a disordered, irregular pattern.
- Gas:** Particles are widely spaced and arranged in a completely random, disordered pattern.

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**PLATE XLVIII. PERSONAL ADORNMENT — BEADS OF POTTERY, BONE, AND SHELL, AND
PENDANTS OF SHELL.**

Fig. 1 (20-94a). Beads of pottery. From surface of farm. Presented by Col. Frederick H. Blerbower.

Fig. 2 (20-795). Bead made of bone. From near the left hand of skeleton 63, mound 2.

Fig. 3 (20.0-4907). Bead made of bone. From farm.

Fig. 4 (20-1159a). Bead made of bone. From general diggings of camp trench.

Fig. 5 (20.0-4908). Bead made of bone. From farm.

Fig. 6 (20-1291). Bead made of bone with incised marks. From under pelvis of skeleton 190, in field. (See Plate LIII, Fig. 2.)

Fig. 7 (20-407b). Bead made of bone. From general diggings of mound 1.

Fig. 8 (20-95a). Bead made of bone. From surface of farm. Presented by Col. Frederick H. Blerbower.

Fig. 9 (20-95b). Bead made of bone. From surface of farm. Presented by Col. Frederick H. Blerbower.

Fig. 10 (20-95c). Bead made of bone. From surface of farm. Presented by Col. Frederick H. Blerbower.

Fig. 11 (20-419b). Bead made of bone. From general diggings of mound 1.

Fig. 12 (20-924). Cylindrical beads made of shell. From neck of skeleton 121, mound 2.

Fig. 13 (20-464). Disc-shaped beads made of shell. From general diggings of mound 1.

Fig. 14 (20-446). Disc-shaped beads made of shell. From near neck of skeleton 16, mound 1.

Fig. 15 (20-838). Cylindrical beads made of shell. From right elbow of skeleton 74, mound 2.

Fig. 16 (20-1304). Beads made of marine shell. From neck of skeleton 194, embankment of sink hole.

Fig. 17 (20-944). Bead made of the columella of the busycon. From general diggings of mound 2.

Fig. 18 (20-115a). Bead made of the columella of the busycon. From surface of farm. Presented by Col. Frederick H. Blerbower.

Fig. 19 (20-867a). Bead made of olivella. From waist of skeleton 91, mound 2.

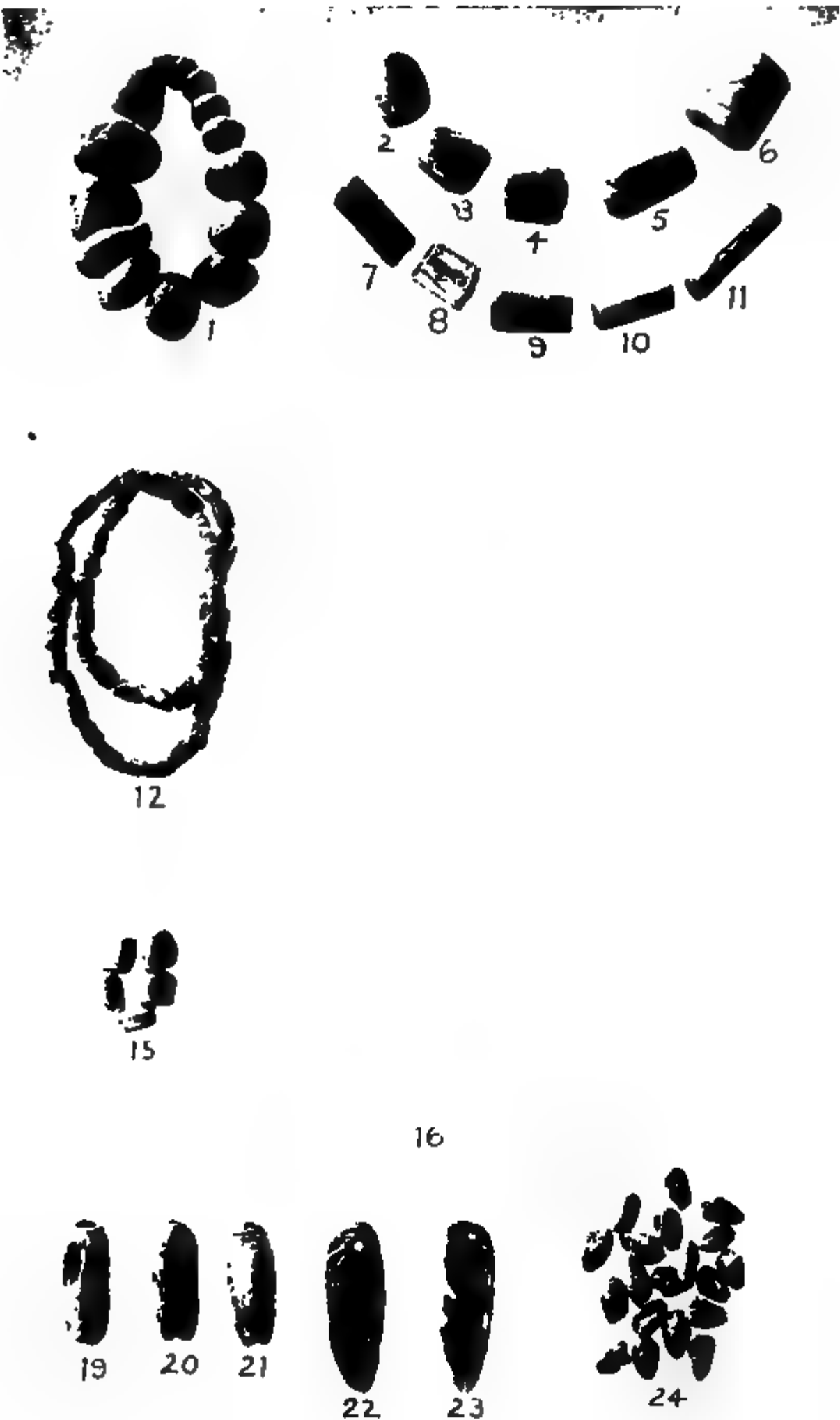
Fig. 20 (20-867b). Bead made of olivella. From waist of skeleton 91, mound 2.

Fig. 21 (20-867c). Bead made of olivella. From waist of skeleton 91, mound 2.

Fig. 22 (20-1267a). Pendant made of olivella. From breast of skeleton 178, hillside.

Fig. 23 (20-1267b). Pendant made of olivella. From breast of skeleton 178, hillside.

Fig. 24 (20-1020a). Beads made of marginella apicina. From neck of skeleton 132, mound 3.



PERSONAL ADORNMENT.
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**PLATE XLIX PERSONAL ADORNMENT — PENDANTS MADE OF CANAL COAL, BONE,
TEETH, AND SHELL.**

Fig. 1 (20-576). Claw-shaped object made of canal coal, broken at base, but with drilling started on reverse. From general diggings of mound 2.

Fig. 2 (20-88). Lozenge-shaped pendant made of canal coal. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 3 (20-85). Pendant made of canal coal with flattened reverse. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 4 (20-466a). Tooth-shaped pendant made of canal coal. From neck of skeleton 30, mound 1.

Fig. 5 (20-86b). Tooth-shaped pendant made of canal coal. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 6 (20-86a). Tooth-shaped pendant made of canal coal. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 7 (20-87). Tooth-shaped pendant made of canal coal, with ornamental dots. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 8 (20-1174). Pendant (?) made of a thin piece of bone with drilled or gouged perforations. From general diggings of camp trench. (See Plate LIII, Fig. 3.)

Fig. 9 (20-907). Pendants of canine teeth of at least three families of small carnivores. From neck of skeleton 105, mound 2.

Fig. 10 (20-395b). Pendant made of incisor of elk. From general diggings of mound 1.

Fig. 11 (20-105). Pendant made of canine of wolf bearing incised HXII. From surface of farm. Presented by Col. Frederick H. Bierbower. (See Plate LIII, Fig. 6.)

Fig. 12 (20-938a). Pendant made of shell. From general diggings of mound 2.

Fig. 13 (20-1032). Claw-shaped pendant made of shell. From feet of skeleton 137, mound 3.

Fig. 14 (20-431). Pendant made of shell. From general diggings of mound 1.

Fig. 15 (20-386a). Perforated pendant made of a canine tooth of a bear. From general diggings of mound 1.

Fig. 16 (20-385b). Grooved canine tooth of a bear. From general diggings of mound 1.

Fig. 17 (20-103). Pendant made of a canine tooth of a bear. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 18 (20-387). Pendant made of canine tooth of a bear, with one side flattened and the other bearing zigzag incised lines. From general diggings of mound 1.

Fig. 19 (20-471). Crescent-shaped pendant made of shell. From neck of skeleton 30, mound 1.

Fig. 20 (20-111). Pendant made of shell. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 21 (20-427). Pendant made of shell. From general diggings of mound 1.

Fig. 22 (20-897). Pendant made of shell. From left breast of skeleton 105, mound 2.

Fig. 23 (20-434a). Tooth-shaped pendant made of shell. From general diggings of mound 1.

Fig. 24 (20-469a). Pendant made of shell, possibly intended to represent a canine tooth of an elk. From neck of skeleton 30, mound 1.

Fig. 25 (20-434b). Oblong pendant made of shell. From general diggings of mound 1.

Fig. 26 (20-109a). Circular pendant made of shell. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 27 (20-864a). Tooth-shaped pendant made of shell. From neck of skeleton 89, mound 2.

Fig. 28 (20-864b). Tooth-shaped pendant made of shell with incised lines and drilled dots. From neck of skeleton 89, mound 2. (See Plate LIII, Fig. 10.)

Fig. 29 (20-864c). Pendant made of shell with longitudinal incised lines. From neck of skeleton 89, mound 2. (See Plate LIII, Fig. 9.)

Fig. 30 (20-1326a). Tooth-shaped pendant made of shell with transverse perforation. From neck of skeleton 195, in field.

Fig. 31 (20-1070a). Pendant made of shell. From mound 6.

Fig. 32 (20-1078a). Pendant made of shell. From neck of skeleton 159, mound 6.

Fig. 33 (20-479). Pendant made of busyeon shell. From left of jaw of skeleton 34, mound 1.

Fig. 34 (20-874). Pendant made of the columella of the busyeon shell with groove for suspension. From skull of skeleton 95, mound 2.

Fig. 35 (20-937a). Pendant made of shell. From general diggings of mound 2.



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U. S. DEPARTMENT OF AGRICULTURE

PLATE I. PERSONAL ADORNMENT — ORNAMENTS MADE OF STONE, PEARL, AND SHELL.

Fig. 1 (20 1108). Fragment of a gorget made of slate. From general diggings of camp trench.

Fig. 2 (20 79). Stone disc perforated at one edge and partly perforated from each side at the opposite edge. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 3 (20 429). Disc-shaped pendant made of shell with two perforations and five drilled pits. From general diggings of mound 1.

Fig. 4 (20 428). Disc-shaped pendant made of shell with two perforations and bearing incised lines. From general diggings of mound 1.

Fig. 5 (20-870). Perforated shell disc bearing incised lines and pearl bead. From near clavicle of skeleton 92, mound 2.

Fig. 6 (20 112). Shell ornament with perforation in each end. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 7 (20 764). Perforated shell ornament. From near right arm of skeleton 60, mound 2.

Fig. 8 (20 430). Shell ornament with two perforations and notches around the edge. From general diggings of mound 1.

Fig. 9 (20 940). Perforated shell disc. From general diggings of mound 2.

Fig. 10 (20 1340a). Perforated shell disc. From general diggings over grave 196, in field.

Fig. 11 (20 941a). Perforated shell disc. From general diggings of mound 2.

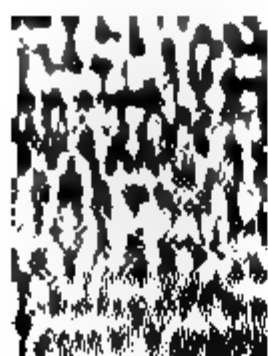
Fig. 12 (20 881). Perforated disc made of busycon shell with two small perforations for suspension. From head of skeleton 98, mound 2.

Fig. 13 (20 941b). Perforated shell disc. From general diggings of mound 2.

Fig. 14 (20 1075). Disc made of shell with two perforations for suspension. From chest of skeleton 155, mound 6.

Fig. 15 (20 1071). Pendant made of shell with two perforations for suspension. From neck of skeleton 144, mound 6.

Fig. 16 (20 1080). Pin made of shell, possibly a nose ornament. From left shoulder of skeleton 159, mound 6.



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PLATE LI. MISCELLANEOUS OBJECTS.

Fig. 1 (20-277). Fragment of a pottery object, possibly of spool shape. From general diggings of mound 1.

Fig. 2 (20-1124a). Fragment of a pottery object, possibly of spool shape. From general diggings of camp trench.

Fig. 3 (20-171). Picked object made of limestone, possibly an unfinished pipe. From general diggings of mound 1.

Fig. 4 (20-278). Crudely modelled pottery object of spoon shape. From general diggings of mound 1.

Fig. 5 (20-439a, b). Miniature pottery dishes. From skeleton 11, mound 1.

Fig. 6 (20-1134a, b). Small pieces of pottery. From general diggings of camp trench.

Fig. 7 (20-778). Part of the upper jaw of a bear cut off through the roots of the teeth. From near legs of skeleton 61, mound 2.

Fig. 8 (20-774). Part of the jaw of a bear cut off through the roots of the teeth. From skull of skeleton 61, mound 2.

Fig. 9 (20-312b). Piece of antler perforated at one end. From general diggings of mound 1.

Fig. 10 (20-309). Perforated penis bone of a raccoon. From general diggings of mound 1.

Fig. 11 (20-686). Transversely perforated penis bone of a raccoon. From general diggings of mound 2.

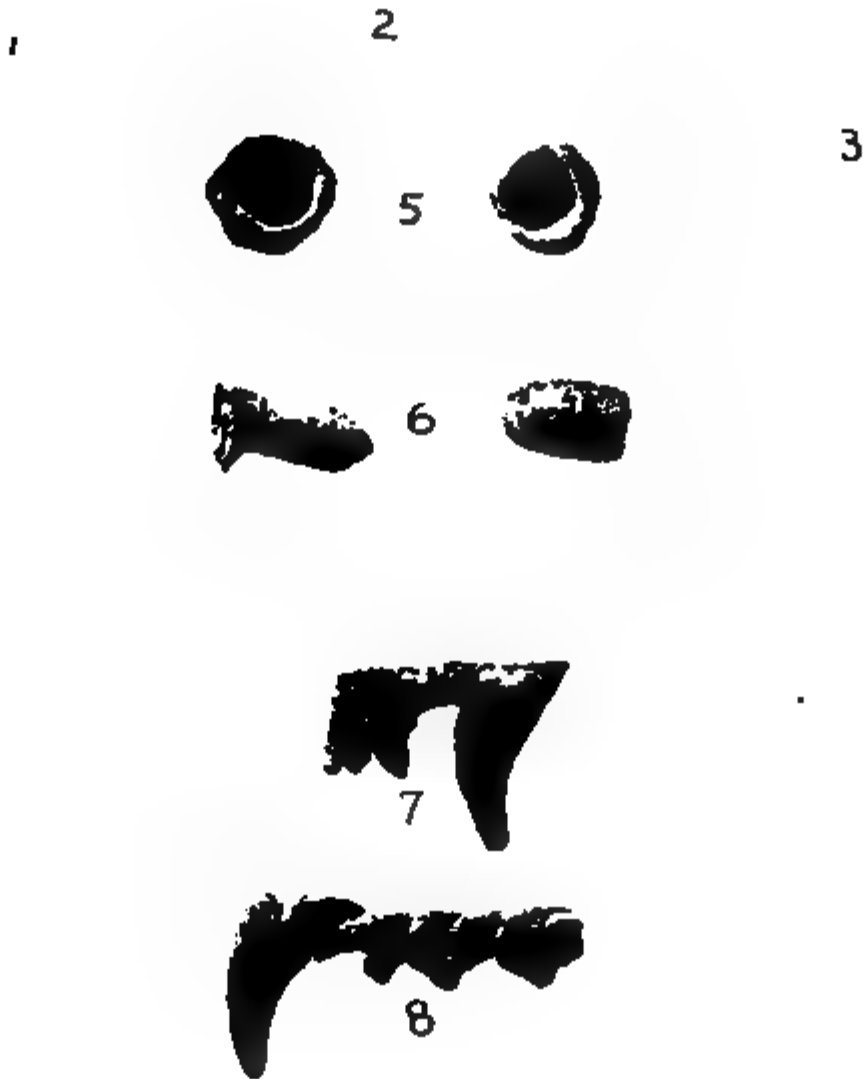
Fig. 12 (20-1082). Cylinder formed of antler possibly an unfinished knife handle. From near left tibia of skeleton 165, mound 6.

Fig. 13 (20-714a, b). Whistles made of bone. From general diggings of mound 2.

Fig. 14 (20-1161). Bone whistle or flute with one perforation on the reverse. From general diggings of camp trench.

Fig. 15 (20-734). Cylinder of bone grooved around and broken off at each end. From general diggings of mound 2.

Fig. 16 (20-337). Object made of bone with spatulate point and perforation through the base bearing mineral deposit. From general diggings of mound 1.



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PLATE LII. ART -- INCISED AND SCULPTURED STONE.

Fig. 1 (20-1109). Incised lines on pipe made of yellowish sandstone. From general diggings of camp trench. (See Plate XLV, Fig. 3.)

Fig. 2 (20-5400). Incised cross on disc made of reddish sandstone. From general diggings of mound 2. (See Plate XLIV, Fig. 16.)

Fig. 3 (20-80). Incised cross in circle on disc made of reddish sandstone. From surface of farm. Presented by Col. Frederick H. Bierbower. (See Plate XLIV, Fig. 9.)

Fig. 4 (20-77). Incised lines on disc made of yellowish sandstone. From surface of farm. Presented by Col. Frederick H. Bierbower. (See Plate XLIV, Fig. 10.)

Fig. 5 (20-1097a). Incised lines and drilled pits in disc made of yellowish sandstone. From general diggings of camp trench. (See Fig. 1a.)

Fig. 6 (20-555). Incised lines and drilled pits in disc made of brownish sandstone. From general diggings of mound 2. (See Fig. 1b, and Plate XLIV, Fig. 11.)

Fig. 7 (20-275). Notches in object made of stone. From general diggings of mound 1.

Fig. 8 (20-181). Incised pictograph on slate pebble. From general diggings of mound 1.

Fig. 9 (20-965). Incised animal form on fragment of disc made of yellowish sandstone. From general diggings of mound 3. (See Fig. 1c.)

Fig. 10 (20-176). Incised human face on pipe of yellowish sandstone. Incised concentric circles and cross lines on reverse shown in Plate XLV, Fig. 10. From general diggings of mound 1.

Fig. 11 (20-771). Incised face on pipe made of yellowish sandstone. From near feet of skeleton 61, mound 2. (See Plate XLV, Fig. 2.)

Fig. 12 (20-173). Incised face on conoid form of unfinished pipe made of reddish sandstone. From general diggings of mound 1. (See Plate XLVI, Fig. 3.)

Fig. 13 (20-1279). Incised human figure on base of unfinished monitor pipe made of yellowish sandstone. From general diggings over grave 177, embankment of sink hole. (See Plate XLVI, Fig. 8.)

Fig. 14 (20-573). Sculptured human face on piece of yellowish sandstone, grooved on reverse. From general diggings of mound 2.

Fig. 15 (20-178). Sculptured moccasin on fragment of a pipe. From general diggings of mound 1. (See Plate XLV, Fig. 9.)



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PLATE LIII. ART -- INCISED, NOTCHED, AND DRILLED. BONE, IVORY, AND SHELL.

Fig. 1 (20-352). Ten notches on awl made of tarsometatarsus of a wild turkey. From general diggings of mound 1.

Fig. 2 (20-1291). Incised bead made of bone. From under pelvis of skeleton 190, in field. (See Plate XLVIII, Fig. 6.)

Fig. 3 (20-1174). Drilled or gouged perforations in pendant made of bone. From general diggings of camp trench. (See Plate XLIX, Fig. 8.)

Fig. 4 (20-727.) Notches and drilled pits on fragment of spatulate object made of bone. From general diggings of mound 2.

Fig. 5 (20-1338). Incised XIII X on pendant made of canine tooth of a wolf. From general diggings over grave 196, in field.

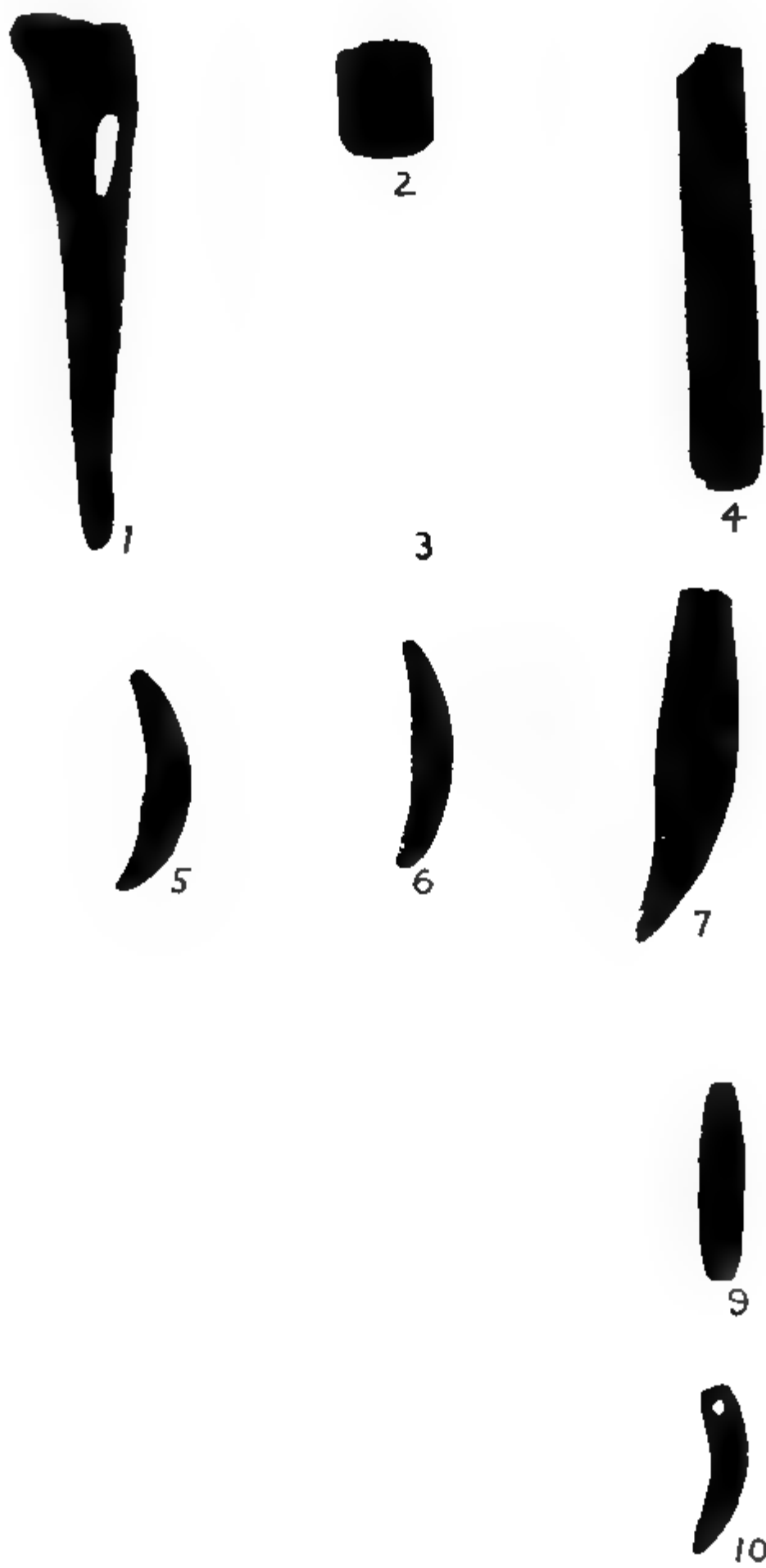
Fig. 6 (20-105). Incised IIXII on pendant made of canine tooth of a wolf. From surface of farm. Presented by Col. Frederick H. Bierbower. (See Plate XLIX, Fig. 11.)

Fig. 7 (20-1178). Incised IIIXIII on pendant made of canine tooth of a bear. From general diggings of camp trench.

Fig. 8 (20-932). Notches in edge of unio shell. From general diggings of mound 2.

Fig. 9 (20-864c). Incised longitudinal line on pendant made of shell. From neck of skeleton 89, mound 2. (See Plate XLIX, Fig. 29.)

Fig. 10 (20-864b). Incised line and drilled pits on claw-shaped pendant made of shell. From neck of skeleton 89, mound 2. (See Plate XLIX, Fig. 28.)



ART - INCISED, NOTCHED, AND DRILLED
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PLATE LIV. ART - Modeled and Painted on Pottery, Sculptured in Stone.

Fig. 1 (20-228a). Modeled row of points on rim of pot. From general diggings of mound 1.

Fig. 2 (20-1124b). Modeled knob with central depression on fragment of pottery. From general diggings of camp trench.

Fig. 3 (20-91). Modeled bird head from rim of pot. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 4 (20-272). Modeled bird head from rim of pot. From general diggings of mound 1.

Fig. 5 (20-55). Modeled bird head from rim of pot. From surface of farm.

Fig. 6 (20-92). Modeled bird head from rim of pot. From surface of farm. Presented by Col. Frederick H. Bierbower.

Fig. 7 (20-622). Modeled bird head from rim of pot. From general diggings of mound 2.

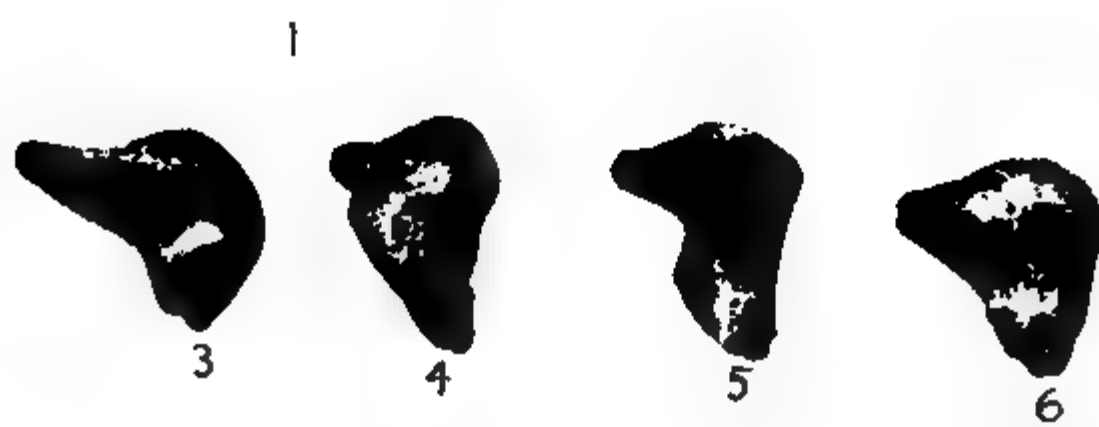
Fig. 8 (20-1127). Modeled human face on rim of pot. From general diggings of camp trench.

Fig. 9 (20-619). Modeled lizard-like form in pottery. From general diggings of mound 2.

Fig. 10 (20-623). Modeled fish-like form in pottery. From general diggings of mound 2.

Fig. 11 (20-270). Line design painted in brown on pottery. From general diggings of mound 1.

Fig. 12 (20-1297b). Pipe of stone of artistic shape. From right hand of skeleton 193, in field. (See Plate XLV, Fig. 8.)



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PLATE LV. ART -- DECORATIONS ON POTTERY DERIVED FROM PROCESSES OF MANUFACTURE.

Fig. 1 (20-624c). Rows of finger impressions on pottery. From general diggings of mound 2.

Fig. 2 (20-591). Finger nail impressions on pottery. From general diggings of mound 2.

Fig. 3 (20-616). Rows of finger nail impressions on rim and neck of pot. From general diggings of mound 2.

Fig. 4 (20-246a). Finger tip and nail impressions on neck of pot. From general diggings of mound 1.

Fig. 5 (20-1125a). Fold of clay to form rim showing row of finger tip and nail impressions equally spaced to press fold into place. From general diggings of camp trench.

Fig. 6 (20-254a). Fold of clay to form rim of pot showing row of finger tip impressions equally spaced to press fold into place. From general diggings of mound 1.

Fig. 7 (20-235a). Fragment of rim of pot showing row of impressions resembling finger tips. From general diggings of mound 1.

Fig. 8 (20-1125b). Fragment of rim of pot showing finger tip and nail impressions. From general diggings of camp trench.

Fig. 9 (20-617). Fragment of rim of pot showing diagonal impressions of finger tips. From general diggings of mound 2.

Fig. 10 (20-248a). Fragment of rim of pot showing fold of clay and rows of impressions equally spaced. The lower row is apparently made with a tool. The upper row possibly an imitation of finger tip impressions. From general diggings of mound 1.

Fig. 11 (20-244a). Fragment of rim of pot showing fold to form rim and row of impressions, equally spaced to press fold into place. From general diggings of mound 1.



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PLATE LVI. ART — PRESSED AND INCISED DESIGNS ON POTTERY.

Fig. 1 (20-602a). Fragment of rim of pot with pressed notches. From general diggings of mound 2.

Fig. 2 (20-1125c). Fragment of rim of pot with pressed notches. From general diggings of camp trench.

Fig. 3 (20-1125d). Fragment of rim of pot with row of modeled points. From general diggings of camp trench.

Fig. 4 (20-243a). Fragment of rim of pot with row of modeled points. From general diggings of mound 1.

Fig. 5 (20-600a). Fragment of rim of pot bearing ridge incised into notches before firing. From general diggings of mound 2.

Fig. 6 (20-268). Fragment of rim of pot bearing ridge incised before firing into notches. From general diggings of mound 1.

Fig. 7 (20-1125e). Fragment of rim of pot bearing row of modeled points. From general diggings of camp trench.

Fig. 8 (20-600b). Fragment of rim of pot bearing design apparently drawn in the clay with the finger or a blunt implement. From general diggings of mound 2. (See Fig. 1g.)

Fig. 9 (20-618). Fragment of rim of pot bearing design apparently drawn in the clay with the finger or a blunt implement. From general diggings of mound 2. (See Fig. 1f.)

Fig. 10 (20-967). Pipe made of pottery bearing two encircling grooves between which are five dots all apparently made by drawing and pressing in the clay with a blunt implement. From general diggings of mound 3. (See Plate xiv, Fig. 11.)

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PLATE I.VII. ART - - INCISED POTTERY.

- Fig. 1 (20-245a). From general diggings of mound 1.
Fig. 2 (20-237a). From general diggings of mound 1.
Fig. 3 (20-245b). From general diggings of mound 1.
Fig. 4 (20-1125f). From general diggings of camp trench.
Fig. 5 (20-246b). From general diggings of mound 1.
Fig. 6 (20-248b). From general diggings of mound 1.
Fig. 7 (20-602b). From general diggings of mound 2
Fig. 8 (20-230). From general diggings of mound 1.

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PLATE LVIII. ART INCISED POTTERY.

- Fig. 1 20-242d. From general diggings of mound 1.
Fig. 2 20-202a. From general diggings of mound 1. (See Fig. 1d.)
Fig. 3 20-251a. From general diggings of mound 1.
Fig. 4 20-817. From above grave 70, mound 2.
Fig. 5 20-240b. From general diggings of mound 1.

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ART—INCISED POTTERY.
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PLATE LIX. ART -- INCISED POTTERY.

- Fig. 1 (20-201). From general diggings of mound 1. (See Fig. 1c.)
Fig. 2 (20-600c). From general diggings of mound 2.
Fig. 3 (20-1125g). From general diggings of camp trench.
Fig. 4 (20-203). From general diggings of mound 1.



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PLATE LX. METHOD OF BURIAL — MOUND.

Fig. 1 Neg. 42702 (181, 865) Mound 2 containing many stone graves. From the south. Stake B 3, to left; B 2, in foreground; C, in middle foreground; B 1, near stump to right; B 4 beyond center, not shown.

Fig. 2 Neg. 42700 (179, 860). Altar 2, mound 1. From the west.



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PLATE LXI. METHOD OF BURIAL.—SKELETONS IN MOUNDS.

Fig. 1 Neg. 42706 (185, 869). Skeletons flexed and at length in mound 1. From the west. Skeletons 34, 47, 40, 33, 32, 26.

Fig. 2 Neg. 42724 (203, 890). Skeleton 83, rock heap and grave 87, mound 2. From the west. Stake C shows near shovel at center of mound. Stake B 1 shows at right upper corner.

METHOD OF BURIAL—SKELETONS IN MOUNDS.
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PLATE LXII. METHOD OF BURIAL - STONE GRAVES.

Fig. 1 Neg. 42742 (222, 911). Grave 188. From the northeast. Stake 2 shows in background. Mound 6 outside of grave beyond top of grave 188.

Fig. 2 Neg. 42743 (223, 912). Skeleton at length in grave 188. From the north north-east

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PLATE LXIII. METHOD OF BURIAL - STONE GRAVES.

Fig. 1 Neg. 42732 (211, 900). Grave 137 before removing any stones. From the west stake 1 shows in right foreground.

Fig. 2 Neg. 42740 (220, 909). Skeleton 178 on stone pavement. From the south. stake 2 shows in left background

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PLATE LXIV. METHOD OF BURIAL -- DOUBLE BURIAL.

Fig. 1 Neg. 42716 (195, 880). Skeleton 70, partly covered with bones of skeleton 77. From the west. Stake marking grave 71 shows near knife.

Fig. 2 Neg. 42717 (196, 881). Same as Fig. 1 after bones of skeleton 77 had been removed. From the west.

METHOD OF BURIAL — DOUBLE BURIAL.

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